THE IRON AGE

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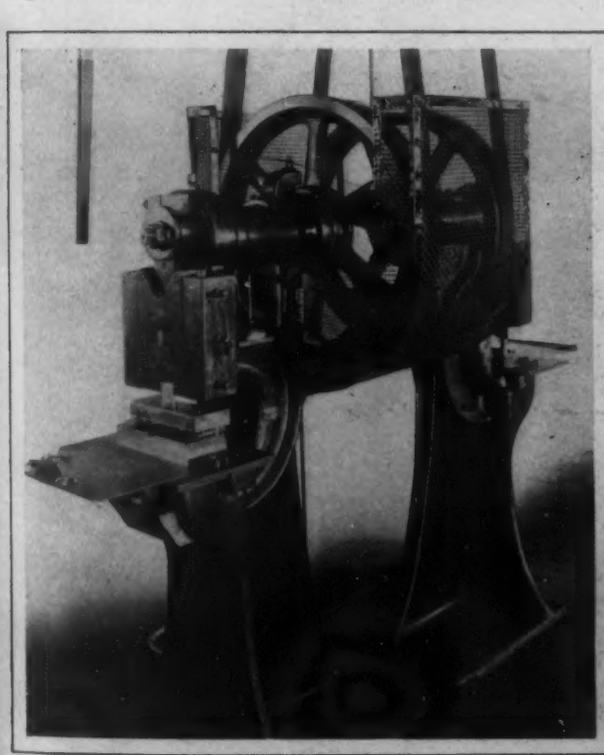
Wire Mesh Guards for Machinery

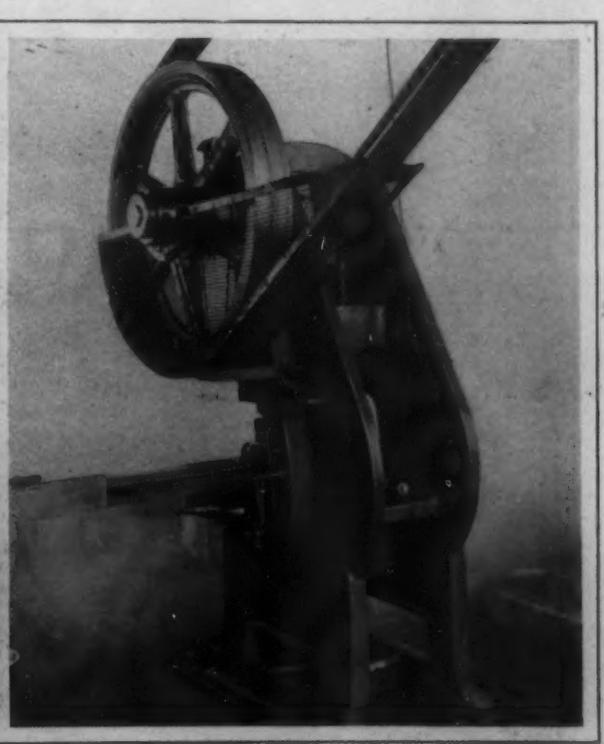
Valuable Suggestions for the Extended Application of Safeguarding Devices Obtained from the Practice Followed in the Remington Typewriter Works

A consistent use of what may be termed the non-opaque guard for protecting operatives around machines and an extended application of the principle of thus recognizing a human weakness to see the moving parts in action, even to the safeguarding of the smooth revolving shaft, are shown in the Remington Typewriter Works, Ilion, N. Y. Considerable information on this and other problems having to do with the works management side of the industrial establishment has already been given by John Calder, former manager of the Ilion works and now associated with the Cadillac Motor Car Company, Detroit. Some of Mr. Calder's contributions have been made to the American Society of Mechanical Engineers, but none, or practically none, of the safeguarding apparatus here illustrated has appeared before, and the accompanying notes will therefore be of interest. Exigencies of space have in some cases required considerable reduction of the original photographs, but it is believed that the ideas suggested will be clearly understood. Some of the views were shown in an address which Mr. Calder delivered some time ago before the City Club of Philadelphia, discussing accident prevention in relation to machinery, the economical phases of safeguarding and the requirements which laws should demand, as noted at length in *The Iron Age* at the time.

So far as possible, the views are reproduced in groups. For example, two illustrations on page 175 show guards for flywheels in various positions. The illustration at the top of page 176 belongs also to that group. The remainder of the pictures on pages 176 and 177 cover guards for belts and pulleys, mostly near workers. Another interesting group of pictures is included on pages 178 and 179. Two of the pictures on page 178 and one on the top of page 179 are guards for milling cutters. The picture on the top of page 178 shows the extent to which one may go in protecting even the revolving shaft. The lower part of the group of pictures on page 179 covers largely guards for special machines.

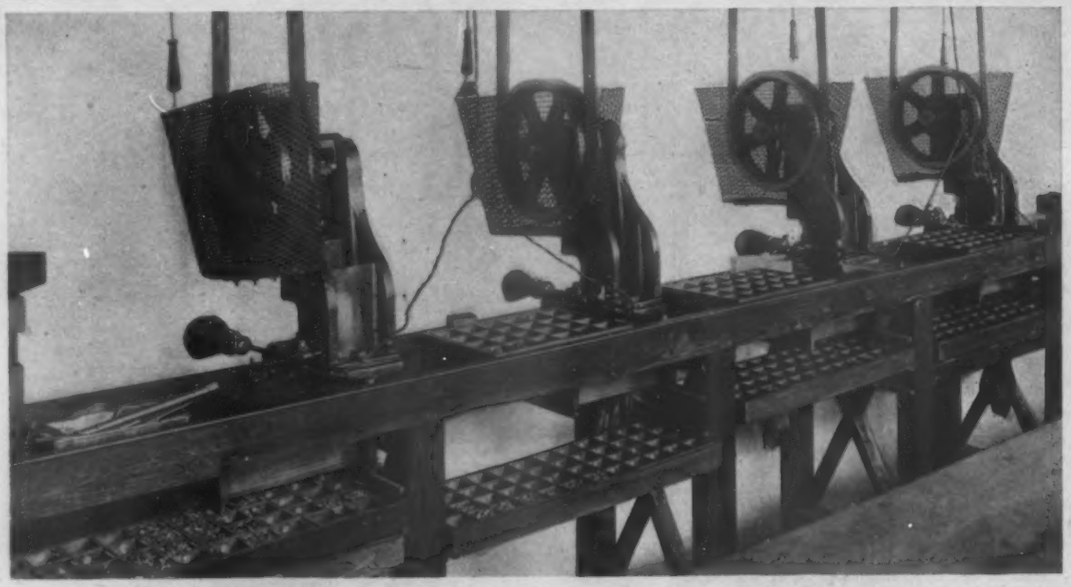


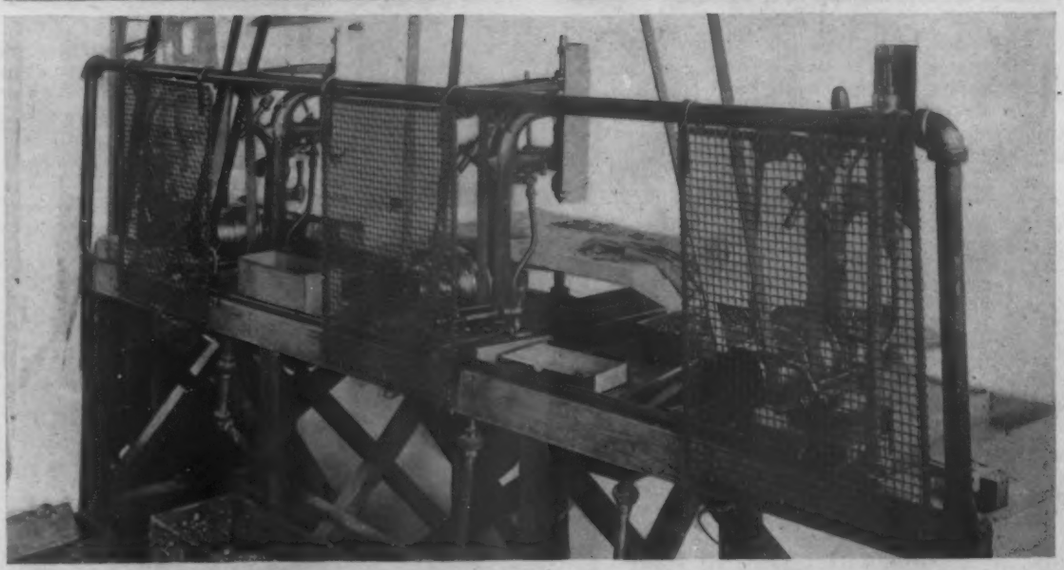
Combination Guard Closing Narrow Passage Between Machines

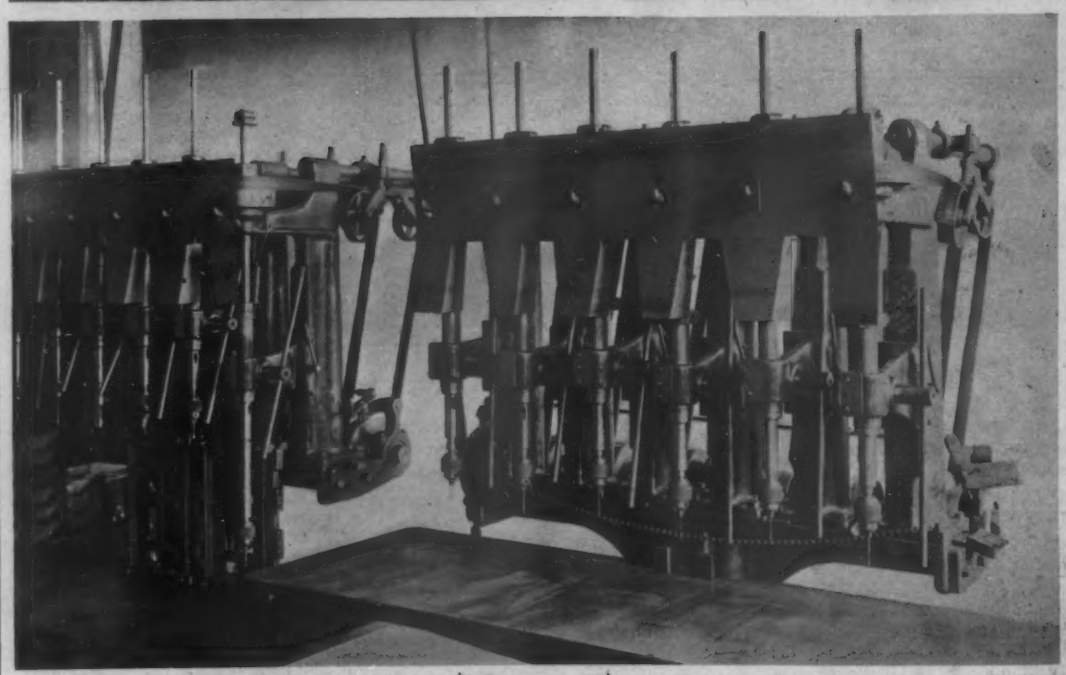


Locked Guard with Quadrant Section Dropped for Belt Adjustment

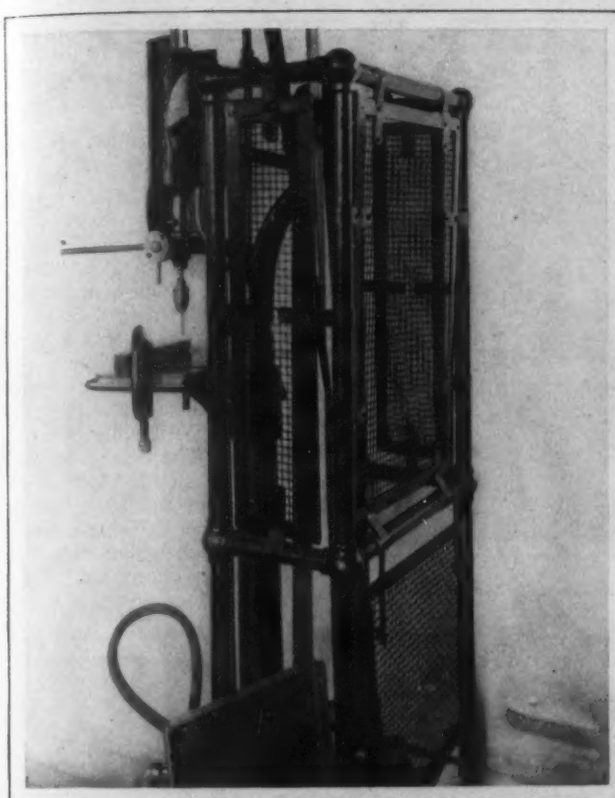
The Remington works employs over 3000 persons, 500 of whom are women. Besides a large amount of stationary equipment, there are 1600 machines driven by mechanical power and about 100 operated by manual power. No patented guards are used and any device illustrated may be copied without restriction. Safeguards, except where oil and liquid splashing is to be avoided, are uniformly steel mesh work, reinforced on the edge with



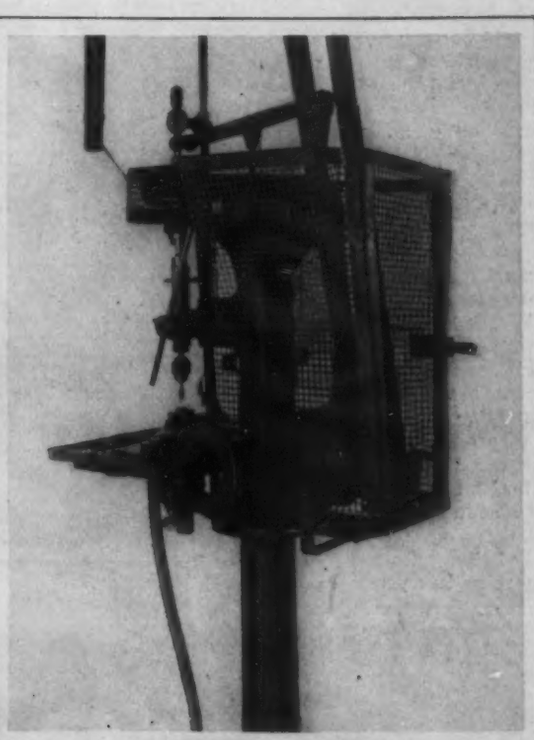




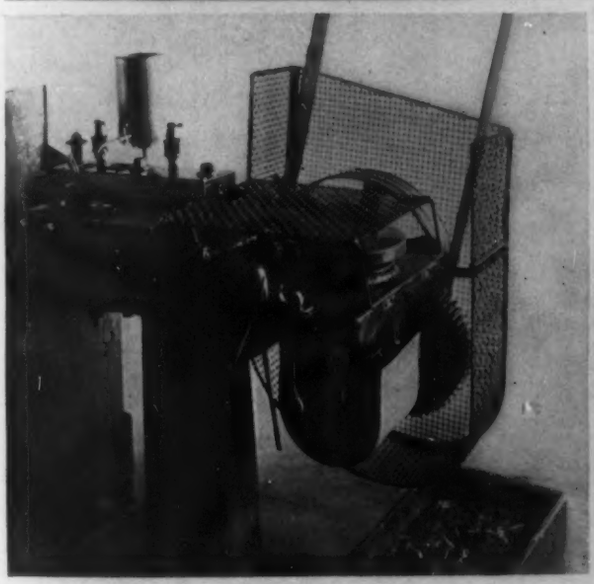
Locked Wheel Guards of the Type Trimmers Worked by Women
Protection for a Battery of Bench Drilling Machines
Six-spindle Drilling Machines with Opaque Guard for Belts and Oil Splash



Safeguarding a Floor-Supported Drilling Machine
Guards for Crank, Gear, Belt and Pulleys of a Thread Rolling Machine



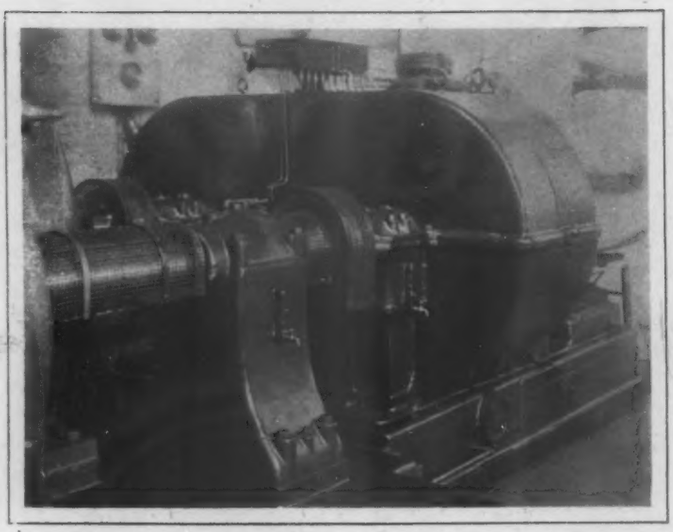
Locked Guards on a Pillar-Supported Drilling Machine
Guards for Gears, Belts and Pulleys of Straightening Rolls



Guards for Gears, Belts, Pulleys and Cranks of an Automatic Wire-Forming Machine

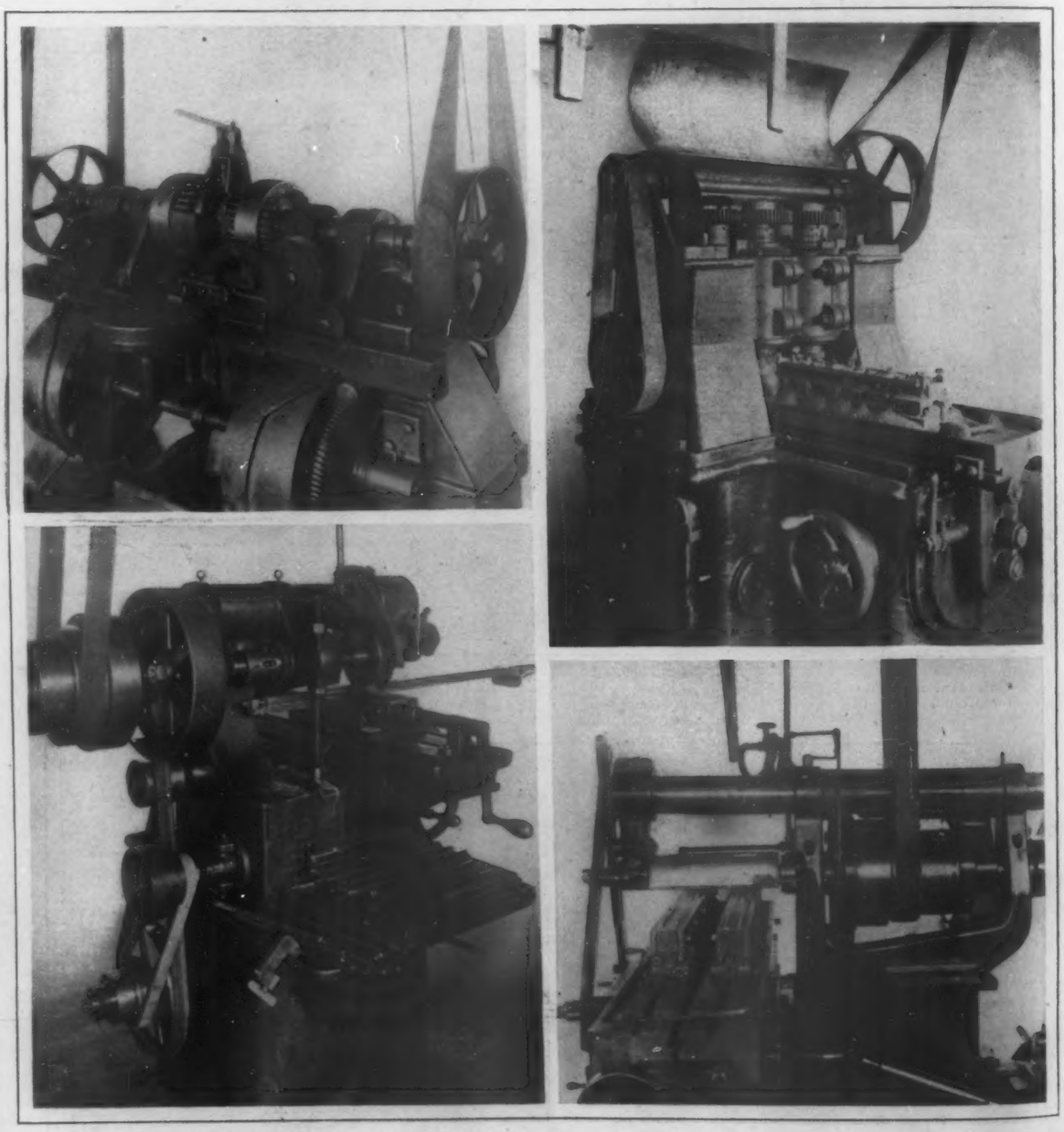
Guards for Fast Driving Pulley, Belt and Feed Gears of a Jones & Lamson Turret Lathe

sheet steel, as the views show. A few opaque guards are employed, but the experience proves that guards are much less likely to be disturbed and laid aside when important working parts of the machinery can be inspected without detaching a guard. Provision is made in the guard design for the ready detachment, although by a person in authority only, of a guard or a portion of one for the adjustment or repair of the machinery. The foundation or supports of the guards are more or less permanent and are usually undisturbed by the necessary removal of sectional parts. Mr. Calder emphasizes that the points to be observed in designing any guard are a study of the real accident risks of the machine and the provision of a safeguard the design of which affords safety, accessibility, machine inspection, durability, and which does not unduly hamper the worker, or, if possible, not at all.



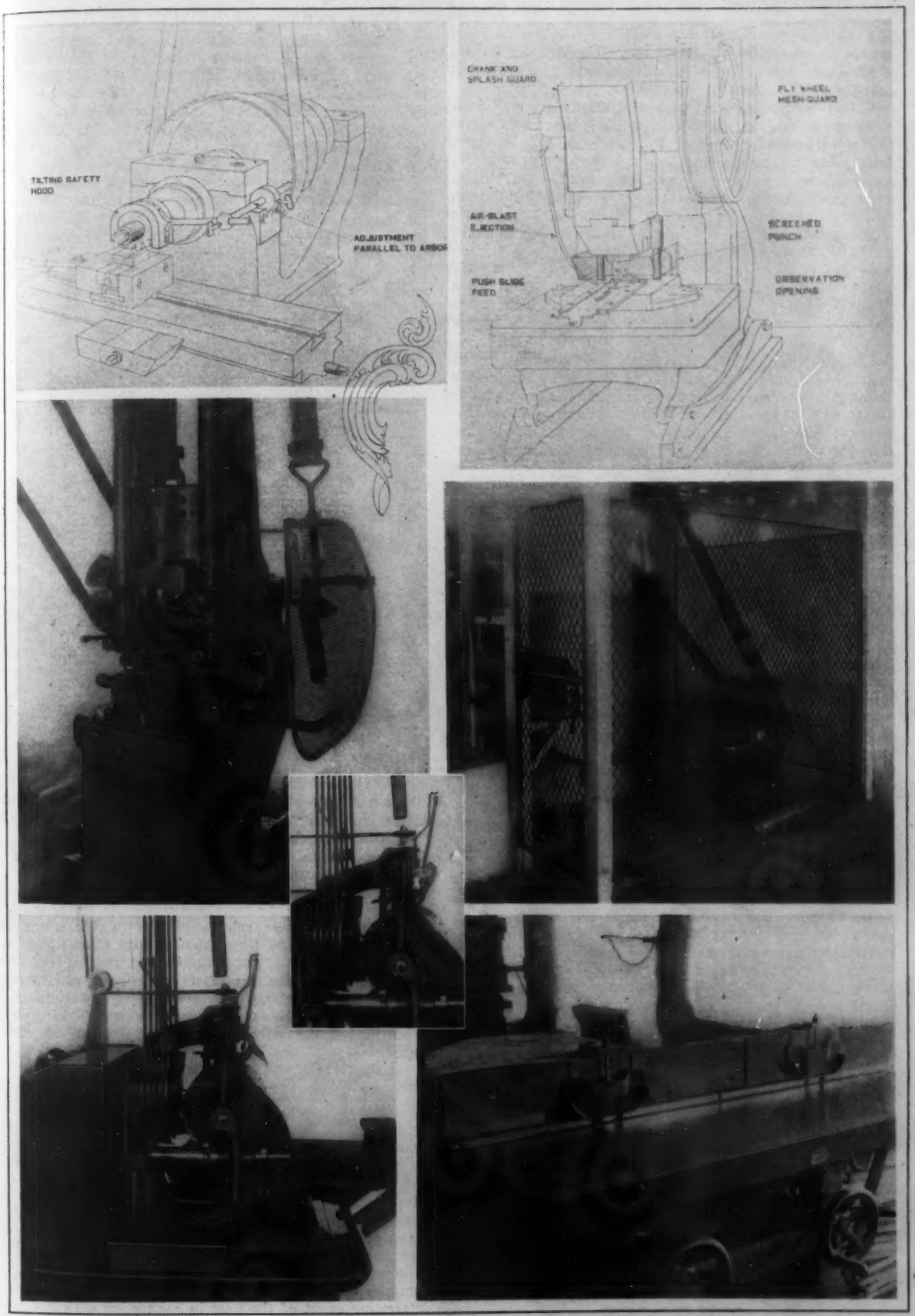
Safeguarding a Steam Turbine

The first of the pictures on page 175 shows a method of protecting two benches having common flywheels. The two wheels are put to-



Guards for a Special Drilling Machine
Protection for a Milling Machine Employed for Cutting Off Stock

Guards for Machine Milling Typewriter Carriages
Opaque Guard for Milling Cutters, with Slots in Top for Feeding Lubricant



Adjustable Milling Cutter Guard
Side Guard for Crank Arm of Drop Hammer
Finger Trigger Guard for Stopping Machine

Guards for Bench Presses
Standard Form of Departmental Motor Drive
Protection for a Double-Spindle Wood Shaper

gether and a guard is made that covers both wheels, preventing anyone from passing between the narrow space between the two machines. The other picture shows what may be called the standard method of protecting flywheels. The guard is usually hinged and locked so that one may readily make adjustment of the belt or light repairs.

The top picture on page 176 shows a gang of type-trimming machines. Here one of the advantages of the mesh protector is that one can see the way the type is trimmed. The middle picture is a group of bench drilling

machines in which the guard is three times the width of the machine, so that the machine itself is not touched except by the authorized persons. The bottom picture shows six spindle drills with an opaque guard for the belts and the oil splash.

The pictures on page 177 show the following: A floor drilling machine, in which everything is cased in so that the women workers cannot touch the moving parts; a floor pillar drilling machine, in which the gearing is locked up but still adjustable; the gears and crank belt and pulleys of a thread rolling machine; guards covering the gear, belt and pulleys of straightening rolls; an automatic wire forming machine, in which, instead of attempting to guard every small moving piece and having the workmen approach very closely, it is considered wiser to put a good strong guard around the machine, hinged in part; and a Jones & Lamson lathe, in which the pulley which drives the machine runs at a high rate of speed, and if struck by a man's arm would be calculated to break it.

The pictures on page 178 cover the following: The guard, in the open position, covering the gears of a carriage milling machine; covered gears of a special machine made for typewriter manufacture, drilling 84 holes in one operation (there are 42 drills, but the holes are so close together that the drilling has to be done in two movements, 21 on each side. It is pointed out that even the gap between the gears is protected); opaque guards for heavy milling machine cutter, the lubricating fluid being fed through the slots in the top of the guard; a form of milling cutter guard, in which the cutter is used to cut off stock, this guard in two parts—one fore and the other aft—so that should the roll rise up out of the gears of the cutter, as it sometimes does, instead of breaking off the gear with a shock, it is simply lifted gently with a spring back again; and safeguarding the steam turbine. The steam turbine runs at 9000 r.p.m and is geared to a speed of 600 r.p.m. The couplings are close to the bearings, and the engineer can go close to the machine and run no risk of being wrapped around the shaft.

The cuts on page 179 comprise the following: A sketch showing a safeguard application for a milling machine, recognizing that the spindle has a motion parallel to the arbor and requiring a tilting hood to make allowances for 6 in. variation in the length of the arbor. Method of protecting small so-called bench presses worked by women. In this the belt wheel is locked in and the oil splash and crank are protected by a guard to prevent the liquid being thrown out. The work is pushed in by the slide shown, and is thrown out by a cam-actuated air blast. Light work is thrown out by the blast and there is no necessity for having the hands under the working parts. Another picture shows a guard for the crank controlling a drop hammer of variable stroke. Another view shows a finger guard for stopping a machine in automatic work. A young woman operator uses the machine fitting type levers. Should she turn around to speak to a neighbor or look away indifferently and allow her hand to travel on with the work, injury would result were it not that the moment anything touches the gear it is stopped. The small picture shows the trigger stop in action. The fingers cannot travel more than an inch, so that the operator is abundantly protected.

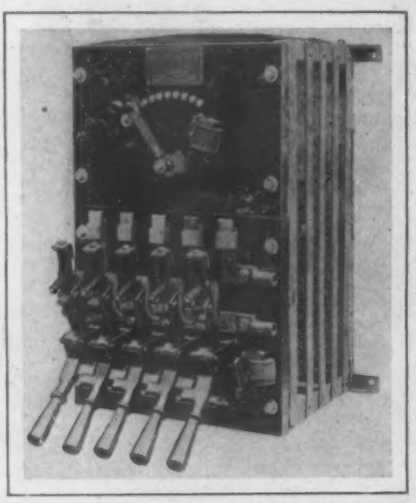
Another one of the engravings on page 179 shows a guard used in the pattern shop for a wood shaper. There is a spring control catching on the work and rising as high as the piece to be worked, but giving no possibility for the piece to fall out. Another one of the views shows the standard method of protecting the motor drive. The motor is shut up in a case which is locked, and the control box is on the outside and accessible. In the picture shown the belt is brought up through the floor.

The Imperial Steel & Wire Company, Collingwood, Ont., Canada, it is rumored, will be the holding company for a merger which will include a number of independent wire mills. The $300,000 of preferred stock, recently issued by the Imperial company will, it is said, be available to secure control in competitors. The company's mills have been running steadily night and day for four years, Sundays excepted, which is a record in Canada. The output of its nail mill is 800 kegs per day.

Combination Motor Starter and Regulator

A new type of controller for use on 115, 230 and 500 volt circuits has been recently brought out by the Cutler-Hammer Mfg. Company, Milwaukee, Wis. This device is built in sizes of from 10 to 200 hp. and consists of a multiple switch starter and a shunt field speed regulator. The particular field for which this controller is adapted is for use with large motors or those of medium size where the starting conditions are somewhat severe.

The motor starting rheostat is similar to the maker's standard multiple switch starter intended for use where the duty required is the same, and each of the individual levers when closed cuts out a step of the armature resistance and thus brings the motor up to the normal speed. In the accompanying engraving a 50-hp. 230-volt controller is shown with a field regulating rheostat mounted



A New Large Capacity Combination Motor Starting Rheostat and Speed Regulator with No-Voltage Release Made by the Cutler-Hammer Mfg. Company, Milwaukee, Wis.

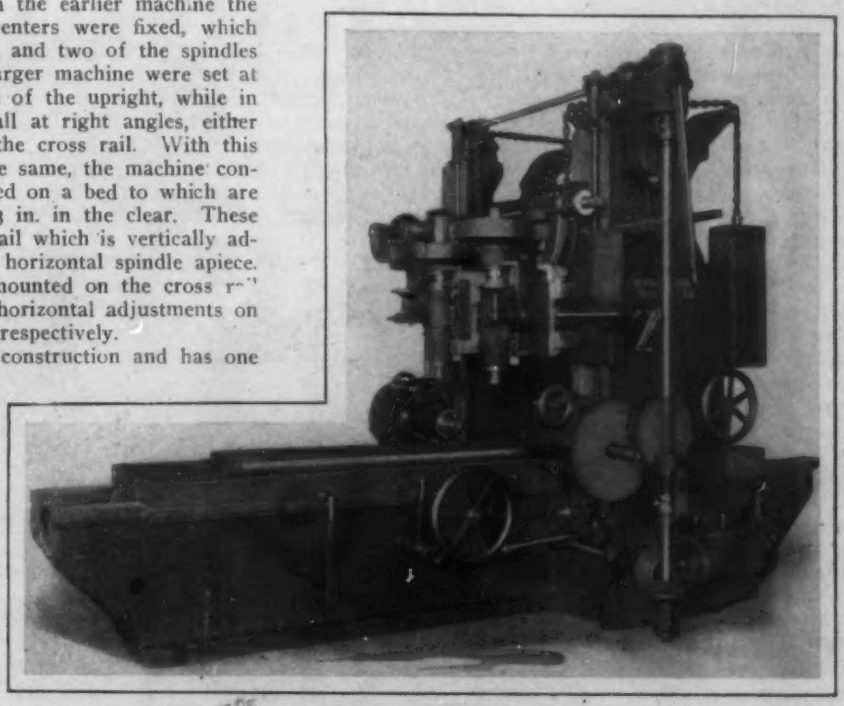
on the top. The rheostat consists of a series of field resistance steps controlled by a single lever, and when the motor has been properly accelerated to its normal speed by cutting out the armature resistance, any further increase is secured by manipulating the lever of the field regulating resistance.

If the main line switch is opened or the current supply is interrupted for any reason while the motor is operating, the no-voltage release on the starter opens the starting switches and this action in turn de-energizes the no-voltage release of the field rheostat, causing the lever to return to the position where all of this resistance is inserted in the circuit. In this way it is made impossible for the motor to be started on a weakened field or with a portion of the armature starting resistance short-circuited.

Japanese Sheet and Tube Works.—The British Commercial attaché at Yokahama writes concerning developments in the Japanese steel industry: "For some years past there has been talk of establishing a company in Japan for the manufacture of steel pipes and tubes, and of late the project seemed to assume more definite shape when a well-known Japanese firm were said to be making all preparations for manufacture by the Mannesmann process. This venture, however, seems to have been postponed, and another set of promoters, including some prominent men, is discussing the possibility of forming a company and starting work in September, 1913. The most interesting event of the year in connection with the trade in galvanized sheets has been the establishment of a galvanizing company at Osaka, which is now producing about 5½ tons per day. The sheets are said to be of rather poor quality, but they, nevertheless, command a fair price. The enterprise at present is more in the nature of an experiment, and its success will depend very largely on the price at which British black sheets are to be bought, for it will probably be some time before the Imperial Steel Works at Wakamatsu will be able to roll the thin sheets required.

New Four-Spindle Milling Machine

For performing a number of milling operations simultaneously, the Beaman & Smith Company, Providence, R. I., has recently brought out a new type of four-spindle milling machine. The general construction of the machine is the same as the company's nine-spindle milling machine which was illustrated in *The Iron Age*, April 25, 1912, with the exception that in the earlier machine the distances between the spindle centers were fixed, which is not the case in this machine, and two of the spindles carried by the uprights in the larger machine were set at an oblique angle with the plane of the upright, while in this machine the spindles are all at right angles, either to the face of the upright or the cross rail. With this exception the construction is the same, the machine consisting of a work table supported on a bed to which are attached two uprights spaced 43 in. in the clear. These uprights in turn carry a cross rail which is vertically adjustable upon them, and also a horizontal spindle apiece. The two vertical spindles are mounted on the cross rail and all four have vertical and horizontal adjustments on the uprights and the cross rail respectively.



A New Four-Spindle Milling Machine Built by the Beaman & Smith Company, Providence, R. I.

The table is of square lock construction and has one side and two under gibs to compensate for wear. The work surface is 30 in. wide and 10 ft. long, and there are five T-slots finished from the solid cut in its upper surface, together with two rows of holes for stop pins. A movement of 11 ft. on the bed is available and there is a quick power movement of from 7 to 14 ft. per minute in either direction. The table feeds, which are nine in number and range from 2 to 12 in. at any spindle speed, are positive in either direction and are secured through gearing contained in a feed box. These changes can be quickly made from one rate of feed to another while the machine is in operation without stopping it, and there is a second feed box, the gearing of which is so arranged as to reverse the feeds when the spindles are reversed.

Crucible steel is used for the spindles, which run in phosphor bronze boxes and have 6-in. independent adjustments. The centers of the vertical spindles are 6 in. in advance of the horizontal spindle centers, and the distance from the end of the vertical spindle to the top of the table can be varied between 1 and 30 in. by moving the spindles in conjunction with the cross rail, which is raised or lowered by power, and also has hand adjustment. The minimum distance between the spindle centers is 12 in. and this can be increased to 30 in. if desired. The horizontal spindles can be adjusted so that the distance between their ends ranges from 18 to 30 in. The spindles have a vertical movement of 25 in. on the upright, the minimum distance between the top of the table and the center of the horizontal spindles being 1 in. All of the spindles can be run singly or in any desired combination of the four at speeds varying from 6½ to 50 r. p. m. If desired, the vertical spindles can be run at twice the speed of the horizontal ones and vice versa. The ends of all four spindles can be made to fit any type of cutter that may be specified by the purchaser.

The front spindle bearings are 4 in. in diameter and 6 in. long, while the rear ones are slightly smaller, being 3⅝ in. in diameter and 4¾ in. long. All of these bearings are tapered and are arranged to compensate for wear. Either belt or motor drive can be used on the machine and when the latter is employed the power is supplied by a 15-hp. direct or alternating current motor. The distance between the uprights is 43 in. and the weight of the machine is approximately 28,000 lb.

A pamphlet descriptive of the hydro-electric development at Parkville, Tenn., for the Eastern Tennessee Power Company, is being distributed by J. G. White & Co., Inc., New York. The publication is a remarkable example of what may be done in the way of high-class printing and illustration.

Fuel Economizer Data

Recent developments in steam plant practice as affecting boiler efficiency and the economical recovery of heat from the gases of combustion are dealt with at length in a 104-page pamphlet issued by the Green Fuel Economizer Company, Matteawan, N. Y. There are a number of charts among which may be mentioned one showing the flue gas temperatures corresponding to different amounts of heating surface per boiler horsepower developed, another showing the temperature relations existing in a boiler and economizer installation and how part of the boiler surface can be advantageously replaced by economizer surface, a performance chart taken from a large electric light plant, two charts showing the lowest temperatures to which it is economical to cool gases by boiler surface and economizer surface respectively, a chart showing the flue gas and boiler feed water temperatures in a large electric railway power house in which the feed water enters the boiler at an average temperature of 20 to 90 deg. higher than the gases leave the economizer and a chart showing the earnings for economizer surface for each 100-deg. difference between the initial temperature of the gases and the initial temperature of the water for different numbers of square feet of economizer surface per boiler horsepower developed. This last chart is based on results developed in some 150 boiler tests and gives a means of foretelling the earnings to be expected from the economizer under given conditions.

An infringement suit in regard to the Knox long-port patent, brought by the Blair Engineering Company against the Keystone Furnace Construction Company, has been upheld by a decree entered July 13 in the United States District Court, Western District of Pennsylvania. The suit covers claims 1 to 12, inclusive, of patent No. 12,939, reissued April 13, 1909, for improvements in furnaces invented by Thomas S. Blair, Jr.

The cyclone resisting power of the Kahn system of building construction is indicated in the case of Regina College, Regina, Saskatchewan, which was recently visited by a heavy windstorm. Partitions of the building were carried away, but the reinforced concrete skeleton, which was built by the Trussed Concrete Steel Company, Detroit, remained in place.

The Owen Steel Crane Company, Cleveland, Ohio, has changed its name to the Peerless Steel Crane Company.

The New Thin-Lined Warwick Furnace

Inwall Cooled by Water Distributed by a Spiral Trough—Bosh Inclosed in a Wrought Steel Casing

The Warwick Iron & Steel Company, of Pottstown, Pa., had practically completed the construction of a new blast furnace of the "thin lined" type before leasing its plants to the Eastern Steel Company. This furnace, which embodies some novel features, has now been in successful operation for some weeks. It is arranged to be used with the stove and power equipment of either No. 1 or No. 2 furnace in case one of them is out of blast.

Fig. 1 shows a general view of the furnace. The vertical section shown in Fig. 2 illustrates in general the design and construction. The entire furnace framework, including the columns, is made of wrought steel and the top platform, charging apparatus, etc., are supported independently of the furnace shell by columns resting upon the main columns which support the furnace. Platforms are provided at various levels so that all parts of the furnace casing may be readily accessible. The lower portions of the furnace columns are inclosed in cast-iron casings filled with concrete.

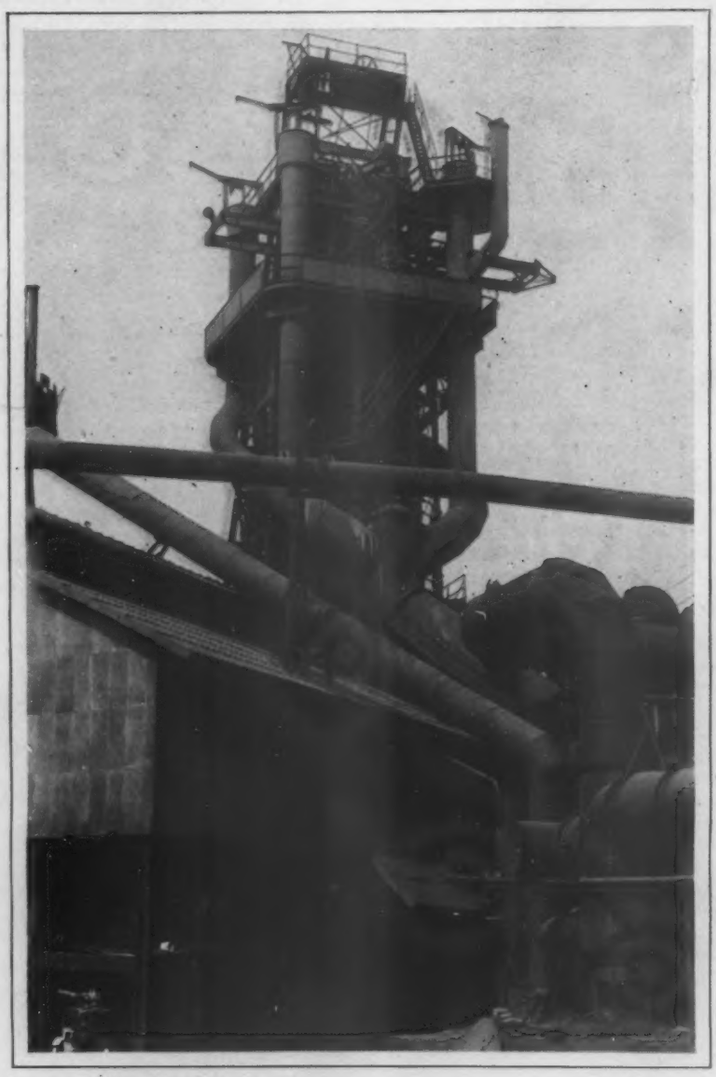


Fig. 1.—The New Warwick Blast Furnace of the Thin-Lined Type

The inwall is cooled by water carried and distributed by a spiral trough constructed under the Roberts patent. The waste water from the tuyères and bosh plates is delivered at different points into the spiral trough by means of an electrically driven pump. The spiral trough is connected to the furnace shell by tap bolts (Fig. 3) which do not pass through the shell, thereby avoiding the possibility of water entering the furnace around the bolts. A washer is provided around each bolt and between the trough and the shell, in consequence of which there is an opening between the bottom of the spiral trough and the shell, which is continuous except for the interference of the bolts. At the lower end of the spiral trough the water is discharged into a horizontal trough which is in turn connected to the drainage system. The construction and operation of the spiral trough are such that while some of the water runs around the spiral, a large quantity passes through the openings at the bottom to the courses of the spiral trough below and so on to the horizontal trough at the lower end of the spiral. In passing from one course of the spiral to that below, the water is in immediate contact with the furnace shell, thereby forming a thin film over the entire shell. Thus the effect of a well distributed spray is secured with the additional advantage that the sides of the spiral trough prevent winds from interfering with the distribution of the water.

The bosh is of the Farrell-Roberts construction, whereby the entire bosh is inclosed in a wrought steel casing having openings for the insertion of the bosh plates. The latter are held securely in position by angles on the inside and outside of the steel casing, the former being above and the latter below the bosh plates. The steel casing inclosing the bosh extends downwards to a point below the top of the hearth jacket and is provided with openings for the tuyères, cinder notch and the row of bosh plates below the tuyères. The hearth jacket is made of wrought steel plates inclosing a series of water-cooled cast-iron plates.

Simplicity has been studied in the design of the furnace mantel. Another conspicuous feature is the provision of a continuous wrought steel casing from the top of the hearth jacket to the top of the furnace. The hopper is supported by an annular ring, the construction being such as to make impossible the leakage of gas around the furnace top.

The furnace is equipped with ten tuyères and two cinder notches. The brick work of the stock line is protected by the Cook patented high carbon steel plates.

The downcomer is connected to the top by four branches equally spaced around the furnace. Each connection is provided with a vertical pipe extending 22 ft. above the furnace platform and furnished with a Roberts relief valve. In the event of a "slip" these valves permit the escape of gas but prevent the discharge of ore, coke and stone.

The furnace charging apparatus is of the Roberts skip hoist design connecting below to the stock transfer system common to all the furnaces of the group. The new furnace with its equipment was built under the designs and supervision of Frank C. Roberts & Co., engineers, Philadelphia, Pa.

It is interesting to add that in the next issue it is the plan to present the particulars of a new blast furnace.

the lower part of which is of the thin-lined design but of which the upper portion is of the familiar type. This also was built under the design of Frank C. Roberts & Co.

The Foundrymen's Convention at Buffalo

From present indications the convention of the American Foundrymen's Association and allied organizations scheduled to be held in Buffalo during the week of September 23 will be the most successful ever held. All Buffalo is aroused to the importance of the sessions of the several organizations, and nothing is being left undone to take proper care of the many visitors expected.

The interest of the city itself has been manifested through the Common Council by the completion of a magnificent exhibition and convention hall. The building formerly was one of the largest armories in the State of New York. It was acquired by the city and upward of $180,000 has been spent by Buffalo to put it in shape for the gathering of foundrymen. The fact that the structure is located within five minutes' walk of the downtown hotel district is a feature not to be overlooked. The main hall of this building is entirely in the clear and it has upward of 47,000 sq. ft. of floor space. In the rear of this hall is a large administration building fitted up with offices, store-rooms, lavatories, etc., and containing two large meeting rooms, each of which is capable of seating nearly 1000 persons. Surrounding the building is open-lot space having nearly as much area as that occupied by the building proper.

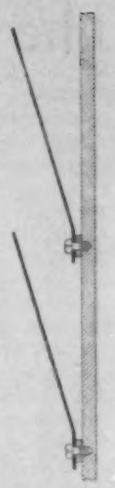


Fig. 3—Spiral Trough as bolted to Furnace Shell.

Previous to May, 1911, Buffalo made no systematic effort to get conventions. Then the Buffalo Chamber of Commerce undertook to do so, with the result that last year 62 conventions were held in Buffalo and thus far this year 70 have been booked. This makes Buffalo one of the leading convention cities of the country.

It should be remembered, however, that Buffalo has unusual natural attractions for convention visitors. While Niagara Falls, of course, is first and foremost, the lake and river resorts for which Buffalo is famous attract many visitors there annually, while the beautiful parks, magnificent residence streets, art galleries, museums, etc., also serve as magnets for many others.

That visitors attending the foundrymen's convention will be sure to see everything of interest in and around Buffalo is practically guaranteed by the activity of the local committee of foundrymen which has been named to attend to such details along with the general arrangements relative to the convention. This committee has held regular meetings since last January. It has been in constant communication with the secretaries of the several organizations allied with the American Foundrymen's Association, and all have worked with a single object in view—the holding of a convention in Buffalo which will eclipse all former events in the history of the several organizations. So much enthusiasm has been worked up that the local committee has been forced to curtail entertainment features in order that there may be no undue interference with the real business of the sessions.

Henry D. Miles of the Buffalo Foundry & Machine Company is the chairman of the general committee in charge at Buffalo. Other chairmen of leading committees are T. L. Richmond, Buffalo Scale Company; W. H. Barr, Lumen Bearing Company; Walter F. Semon, Frontier Iron Works, and Henry W. Wendt, Buffalo Forge Company. Frank W. Tracy of the Buffalo Chamber of Commerce is the chamber's special representative working with the local foundrymen.

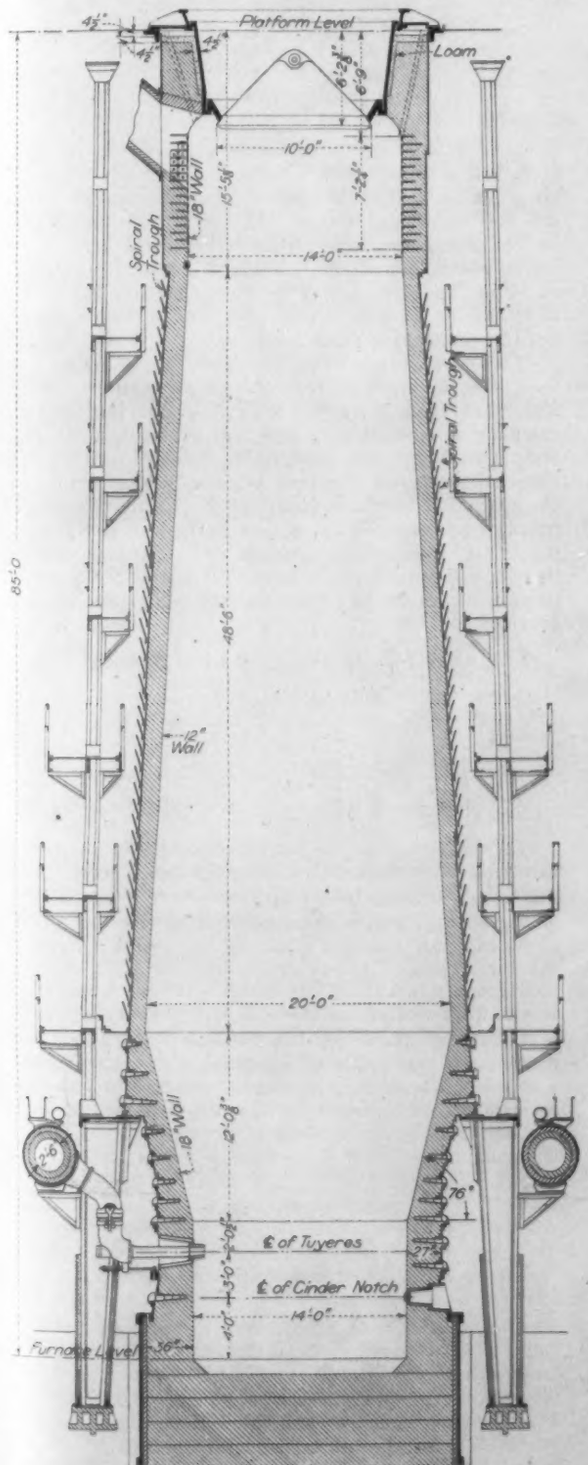


Fig. 2—Section of the New Thin-Lined Warwick Furnace

A Process for Titaniferous Ores

E. H. Rothert of Denver, Colo., and Leavenworth, Wash., recently announced that he has developed a process for the reduction of titaniferous magnetic iron ores. It is stated at Denver that a company has been incorporated under the laws of Colorado to use the process, with the intention of erecting a furnace either at Denver or at Pueblo. The names mentioned in connection with the enterprise are those of Mr. Rothert, D. E. Rowe and R. H. Tatlow, Jr. The statements concerning the operation of the Rothert process are not detailed, so that it is not possible to compare it with the work done by A. J. Rossi of New York State some years ago, full reports of which were given in *The Iron Age* at that time.

The following general statement has been given out by the promoters of the process: "Titanium at the high heat generated in the blast furnace will combine with the nitrogen set free in combustion and form a new compound that enters the slag, making it very heavy and completely choking the furnace. Experiments in the electric furnace caused violent boiling, in some cases the charge rising completely out of the furnace, all of which was largely due to improper fluxing. The inventor of the new process has brought all factors of merit together, including a cheap and perfect fluxing method and a new style of furnace."

Problems of the Factory Metallurgist*

Sampling Steel Billets for Analysis; Light on Segregation—Steel Over-annealed; Worked at Critical Temperature; Supposedly but Not Heat Treated—Carbon Content of Small Bars

BY WILLIAM D. MAINWARING†

This paper deals with some problems that have arisen in actual works practice, in connection with the metallurgy of steel, and the methods that were used in solving them. It will illustrate, in the order named, the phenomena of segregation and the methods of sampling the steel in question from a manufacturer's and consumer's standpoint; the effect of size and temperature of rolled bars and the effects of cold work on the physical condition of steel; also the effects of improper annealing on the structure and strength of test bars from cast steel. It will forcibly illustrate how the manufacturers of machinery and other articles made from steel or iron, who do not have the facilities for producing the castings or forgings that are component parts of the completed machine, are sometimes at the mercy of unscrupulous dealers in these products. The first problem will deal principally with the segregation of sulphur in Bessemer steel and the different results obtained by the various methods used in sampling the steel.

Segregation is defined as the concentration of the more fusible parts of the steel into local centers, which are the last to cool. As the molten steel from the ladle comes in contact with the cold sides of the ingot mold, an outside layer or envelope forms, which is practically of the same analysis in all parts of the layer. As the metal inside this layer cools, crystallites purer than the residual liquid fall out of solution. The remaining mother liquid gradually becomes more impure and of a lower melting point and specific gravity than the rest of the solidified metal, and therefore rises to the top of the ingot.

It might be asked here, Why does not the steel cool in graduated layers of a different composition? The reasons are two: First, the descending current of purer crystallites, as they freeze, landlocks portions of the ascending current of the impure mother liquid. The second reason is that, as all steels and iron have an affinity for carbon, sulphur, etc., the impurities partly diffuse out of the mother liquid into the purer crystallites during and after imprisonment, and it is only a small part of the mother liquid that finally finds its way to the top of the ingot.

Table 1.—Sulphur Analysis.

Car No.	Billet No.	Sulphur.	Car No.	Billet No.	Sulphur.
1104	1	0.132	3978	1	0.112
1104	2	0.070	3978	2	0.125
1104	3	0.072	3978	3	0.112
1104	4	0.100	3978	4	0.040
3385	1	0.150	4927	1	0.160
3385	2	0.153	4927	2	0.120
3385	3	0.160	4927	3	0.093
3385	4	0.087	4927	4	0.100
Car No.	Billet No.	Sulphur.	Car No.	Billet No.	Sulphur.
5194	1	0.143	52632	1	0.169
5194	2	0.130	52632	2	0.168
5194	3	0.115	52632	3	0.091
5194	4	0.115	52632	4	0.069
43487	1	0.133	5581	1	0.123
43487	2	0.090	5581	2	0.155
43487	3	0.081	5581	3	0.169
43487	4	0.119	5581	4	0.198

Note.—Car 5581 previously rejected and ordered shipped back without dispute, on receipt of drillings from these four billets.

That segregation occurs in two ways, namely, from bottom to top and from outside to center, the following will clearly show: The Bessemer steel in question was received in the early part of 1905 from one of the large producers and was intended for welding purposes, as prior to this time very little welding was being done by the electric process. As this came into vogue it was discovered that this class of steel was not suited to electric welding, on account of its great tendency to crystallize under this treatment, and its use was finally discontinued. On analysis it was found that several of the carloads were running abnormally high in sulphur. This class of steel is considered in carload lots, two or three billets being selected from the car for analysis. As soon as this was discovered the different blow numbers were looked for, as it seemed to be a case of stuffing the ballot box as well as of intense segregation. Table 1 shows results of analysis of sulphur first obtained by the regular practice of sampling the steel.

A few of the billets drilled on opposite ends proved that intense segregation of sulphur was present. These results are shown in Table 2, which illustrates segregation of sulphur.

Table 2.—Sulphur Segregation.

Car No.	Billet.	First End Drilled.	Opposite End.
3385	No. 2	0.153	0.075
5194	No. 4	0.115	0.120
43487	No. 4	0.119	0.084
52632	No. 1	0.169	0.160
3978	No. 2	0.125	0.106

The matter was immediately referred to the manufacturers, who sent their representative to the works. He made the claim that the method used in sampling the steel was entirely wrong, stating that they (the manufacturers) had examined the four drilled billets from car No. 5581, taking planings from the outside longitudinally to a depth of ½ in., and found a sulphur content of not over 0.060 and that the steel in question should be drilled from the outside, going to a depth of ½ in.

The superintendent of the plant being away at the time, the expert was referred to the author, who was instructed from the office to follow out the method of sampling as suggested by him, and it was done under protest. One billet was selected from each car, the billets chosen being those that had previously been drilled, with the exception of those from car No. 4927. These billets having been covered up, a new billet was selected. The billets were drilled on opposite ends to those previously drilled, using the method stated. Table 3 shows the comparison of results on billets selected with those previously obtained.

Table 3.—Sulphur Showing by Different Sampling Methods.

Car No.	Billet No.	Author's Method.	Expert's Method.
1104	2	0.132	0.083
3385	2	0.153	0.058
3978	2	0.125	0.056
4927	New Billet	None	0.051
5194	4	0.115	0.050
43487	4	0.119	0.053
52632	1	0.169	0.080

On the return of the superintendent, the question was taken up very vigorously, the claim being made that the method of drilling billets used was very favorable to the steel company, which was supported by results of analysis obtained from drillings taken by the author's method on the same ends of billets drilled for the steel expert and also from side to side to center. It was stated that if billets were drilled on the side, the drilling should continue through the billet, but not being able to do this, a compromise was made by going one-half through. Table 4 shows a comparison of results obtained by the regular practice of drilling and by the expert's method and by drilling from center to side.

Table 4.—Further Comparison of Different Sampling Methods.

Car No.	Billet.	Regular Practice.	Expert's Method.	Side to Center.	Planings from Cut Surface.
3385	No. 2	0.153	0.058	0.150	0.085
5194	No. 4	0.115	0.050	0.118	0.085
43487	No. 4	0.119	0.053	0.117	....
52632	No. 1	0.169	0.080	0.150	0.132

The question was again taken up with the steel company, which requested new drillings. Part of the drillings from side to center were furnished. On making analysis, they again sent their representative, and after consultation with the superintendent and the author, it was decided to select three of the billets drilled from side to center, to cut them in two, to plane this cut parallel with sides and then to take planings from this cut surface. These were

*From a paper presented before the Society of Detroit Chemists.
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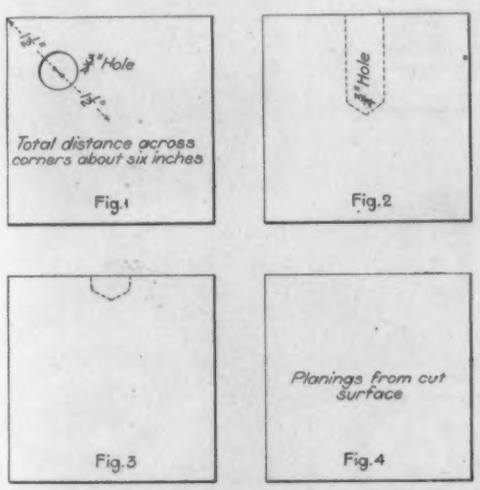
mixed thoroughly and divided into two parts, one to be analyzed for the works and the other by the steel company. It was agreed that if any of the analyses showed over 0.080 per cent. sulphur, which the specifications for this steel called for, all cars in dispute would be ordered shipped back. The results of the analyses are given in the last column of Table 4.

It would seem that billet No. 2 of car No. 3385 was cut in two on the low sulphur end, this billet and No. 4 of car No. 43457 having been shown in table 2 to be very badly segregated and indicating that a higher result would have been obtained if the billet had been cut on the opposite side. An average of the results obtained from the two ends of this billet and of the result obtained by drilling from the side to a depth of ½ in. gives the sulphur content as 0.086 per cent. Assuming no sulphur on the extreme outside surface of billets, and taking the average of this and the results obtained by the regular method of drilling billets, shows that a result very favorable to the steel company is obtained by drilling or planing billets to a depth of ½ in. from outside.

The accompanying sketches illustrate the four methods used in sampling the billets. It should be borne in mind that it is merely an assumption that no sulphur exists on the outside skin of these billets. Possibly the molten metal as it comes in contact with the cold sides of the mold, in the formation of the outside layer, will under certain conditions reject about one-half of the contained impurities. The results prove that a comparative result can be obtained by drilling billets as in Figs. 1 and 2; that method shown in Fig. 3 gives false results and that in



Sketches Showing Methods of Securing Samples of Billets for Analysis

Fig. 4 gives absolute results, but is too expensive and cumbersome for everyday practice where a great many billets have to be analyzed.

Physical Requirements of Large and Small Bars of Same Carbon Content

The second problem deals with the effect of size and temperature on the physical properties of hot rolled bars and will particularly illustrate that if bars of steel of large and small sections are required of a certain specification as to physical strength, a much lower carbon stock should be used on the smaller sections for the reason that the bars of small size will have more work put on them than those of larger sectional area. Also, the smaller bars are very liable to be at a lower temperature at the finishing rolls than the large bars. The more work put on a bar and the colder the steel is rolled the higher will be the tensile strength. The closer the point of recalescence is approached as the finishing temperature, the better will be the physical properties of the steel. If a series of bars of varying sizes of the same carbon stock are rolled at the same finishing temperature, it will be found that as the sectional area becomes smaller the tensile strength raises; also that if another series of bars of the same sectional area, at the finishing rolls, are rolled at varying finishing temperatures, as the final temperatures are lowered the physical strength will be increased.

The accompanying tables will illustrate these points. The bars tested were rolled from medium steel under the manufacturer's standard specifications, calling for the following physical properties: Ultimate strength, 60,000 to 70,000 lb.; elastic limit, not less than one-half the ultimate; per cent. elongation, 1,400,000 divided by ultimate strength; for use for concrete reinforcing bars and inspected by the Pittsburgh Testing Laboratory.

An inspection of Series No. 1, Table 5, will show that the steel was too good for the purpose intended. A considerable amount was rejected by the inspector, as it was above the specification called for, but on pointing out that the ductibility, as measured by the elongation, reduction of area and bending tests, was excellent, the steel was finally accepted by the customers.

Table 5—Physical Properties of the 0.35 Carbon Steel Bars.

Size, in.	Elastic limit.	Ultimate strength.	Elongation, per cent in 8 in.	Reduction of area, per cent.
⅞	44,184	72,741	25.	47.51
¾	47,891	73,471	26.1	51.91
⅝	59,873	79,277	25.	49.67
½	57,800	82,569	15.6	49.51

In the next lot of steel rolled a lower carbon stock was used, on which results shown in table 6 were obtained.

Table 6—Physical Properties of 0.30 Carbon Steel Bars.

Size, in.	Elastic limit.	Ultimate strength.	Elongation, per cent in 8 in.	Reduction of area, per cent.
2½x½	40,854	62,637	25.0	44.06
1-3/16	44,140	64,910	23.4	40.40
1	35,270	67,110	22.6	45.90
⅞	43,800	70,500	24.26	35.60

NOTE.—There is a doubt in my mind of the accuracy of the elastic limit of the 1-in. bar. It was measured by caliper by the inspector and the beam weight noted. With the exception of the ¼-in. rounds listed in Table 8, this steel fulfilled the specifications called for.

In connection with this series two 4 x 4-in. billets of 0.28 carbon steel were rolled down to ⅜ in. round. The first and last ends of the resulting bars were sheared off and marked 1 and 2 respectively, as well as the heat numbers used, and a physical test was made on the cold bars. The first endto enter the finishing rolls as viewed from its color would be about 990 deg. C., while the last end was probably between 700 and 600 deg. C. The results obtained were as given in Table 7.

Table 7—Physical Properties of 0.28 Carbon Stock Rolled into ⅜-in. Bars.

Location of bar.	Elastic limit.	Ultimate strength.	Elongation, per cent in 8 in.	Reduction of area, per cent.
Heat 1505				
First end	49,000	66,500	25.0	48.25
Last End	50,800	70,140	25.	48.05
Heat 2583				
First end	52,000	69,360	23.90	48.03
Last end	54,400	71,328	21.90	48.02

It being intended to roll all the steel required to fill the orders from the same heat numbers as far as possible, in order to have the analysis uniform, the ends of the larger bars, after they had been cut to the desired length, were rerolled into the ¾-in. bars, and it was found that they were about 5000 lb. over the specified limit for ultimate strength. Two bars soaked in a heating furnace for 15 minutes at about 900 deg. C. and slowly cooled in a place warmed by the heat of the furnace failed to lower this strength; in fact, one of the bars was considerably higher.

Table 8—Physical Properties of 0.30 Carbon Bars Rolled to ¼-in. Size.

Bar.	Elastic limit.	Ultimate strength.	Elongation, per cent in 8 in.	Reduction of area, per cent.
Raw	50,100	75,000	23.40	49.10
Soaked in furnace 15 min.	Not Taken	75,500	..	..
		76,000	..	..

Effect of Rolling Bars Too Cold

It has been seen in the foregoing that the lower temperature at which the bar is finished and the more work that is put on it, the higher will be its tensile strength. If this work is carried on well below the recalescence point and tests are made at various stages of this working, it will be found that the bar will become stiffer; that is, it will have greater resistance to bending, and that finally it will not bend at all without breaking. It will fracture simply from the force of the blows directed upon it, showing that the steel has become almost as brittle as glass.

One or two years ago a customer made a complaint that some ovals received for use in making carriage and automobile tops were too stiff for the purpose intended. The discovery was made by a bending test.

In looking up the history of the ovals, it was found that all had been rolled from the same heat number. An analysis was made for carbon only, it being found, from the mill reports, that the other elements were well within the specifications for this class of steel. The 9/16 x 9/32-in. ovals marked hard showed 0.11 per cent. carbon; those marked O. K. showed 0.12 per cent.; ½ x ¼-in. bars marked hard showed 0.13 per cent. carbon and those marked O. K., 0.13 per cent., showing the chemical composition was not at fault. A microscopical examination revealed the fact that the bars marked hard had been rolled too cold, as shown by the elongated condition of the component crystals of the specimens cut from them, while the bars marked O. K. showed the normal crystalline condition.

A Case of Abused Bars

In another case a customer complained that all of the steel he was getting was hard and brittle. Three pieces were sent along to support the claim. They were about 8 in. long, one end having the original 1-in. square section, while the other had been hammered down to about 1½ x ⅛ in. An analysis of the three pieces showed the carbon to be 0.15 per cent.; manganese 0.40 to 0.45; phosphorus, 0.035 to 0.040, these being the hardening elements, proving it to be a good grade of steel. A microscopical examination made on the flattened end showed it to be extremely overworked. On making a bending test this end commenced to fracture after being bent to the angl as shown in Fig. 5.

The bar showing evidences of having been in the fire, the author concluded that it had been heated just below its recalescence point and then hammered down, the work continuing long after the bar was cold, which had made it brittle. To prove that it was not the fault of the steel, one of these hammered ends was heated in a blacksmith forge to about 950 deg. C. and put across two iron bars to cool, which would cause it to be cooled quite rapidly. Even after this rapid cooling the piece was bent flat on itself twice, as shown in Fig. 6, without a trace of fracture, the power hammer being used to give it the final bending. Fig. 7 is a microphotograph of 0.30 carbon stock and shows the characteristic structure of an overworked cold bar. Fig. 8 is a microphotograph after the same stock has been annealed.

Improper Treatment of Cast Steel Test Bars

The fifth problem deals with test bars from cast steel. Last fall it came to the author's attention that an annealed test bar from cast steel had fallen down very badly in the physical test. The data of this bar were as here given. Bar as cast 1⅛ in. square by 14 in. long was heated uniformly in a blacksmith forge and then covered with the burnt coals in the forge over night. The bar was then turned down to ½ in. diameter and the tensile test made.

Analysis.

Carbon	0.27
Phosphorus	0.060
Manganese	0.75
Silicon	0.29

Physical Test.

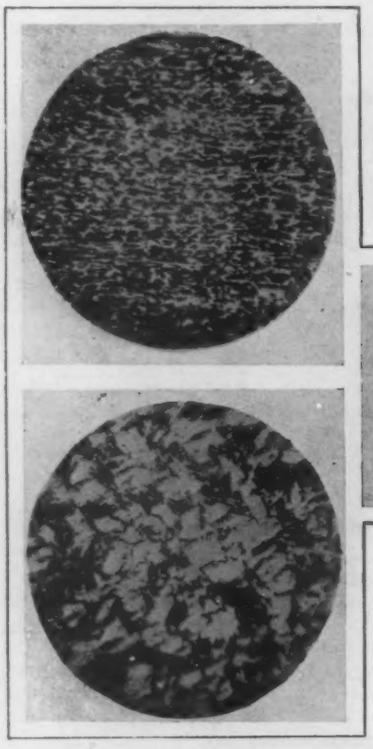
Ultimate strength	62,000 lb. per sq. in.
Elongation	49 per cent. in 2 in.
Reduction of area	50 per cent.

From these data it appeared that the bar had been overannealed, causing the pearlite and ferrite to segregate in large areas, which would give a weak structure, and the author suggested that a sample be furnished for microscopical examination. Fig. 9 shows the structure of this bar, which substantiates the reasoning.

A second bar was taken from the same blank, heated uniformly throughout, quenched in water, heated again and then annealed. It was then turned down to ½ in. diameter and a physical test made with results as follows: Ultimate strength, 74,000 lb.; elongation in 2 in., 39 per cent.; reduction in area, 40 per cent. Fig. 10 shows the structure of this bar. No test bar should be treated differently from the steel it is supposed to represent is treated, in order to get a high tensile strength.

UTILITY OF MICROPHOTOGRAPHS

Fig. 5 shows angle at which steel fractured on bending. Fig. 6 shows the result after being heat treated. Fig. 7 is a microphotograph, at present size about 200 diameters, of the metal as cold worked and Fig. 8 is a microphotograph to a similar reduction, cold worked and annealed. Figs. 9 and 10 are microphotographs, now at 110 diameters, of test bars of cast steel. Fig. 9 shows a state of over-annealing and Fig. 10 shows what occurs after heat treatment



Figs. 7 and 9

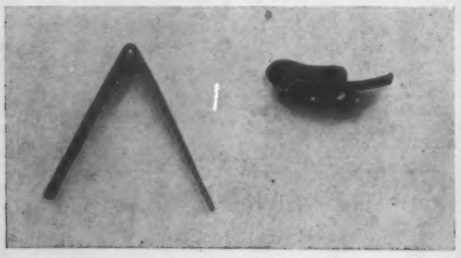
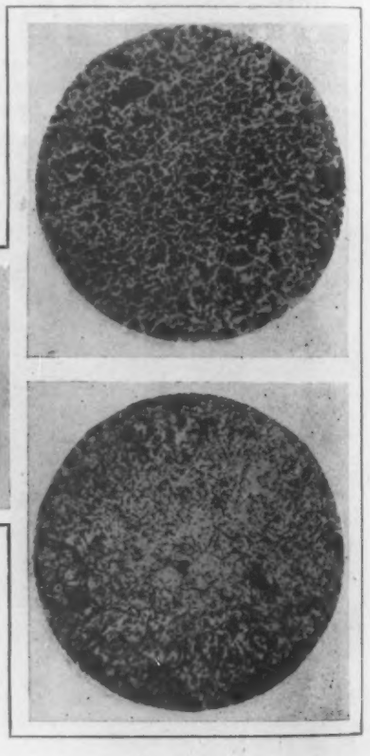


Fig. 5 Fig. 6



Figs. 8 and 10

Metallography for Studying a Fractured Casting

The last problem to be mentioned had to do with the breaking of the crankshaft of a single-cylinder single-valve center-crank upright engine, connected direct to a 180-kw. engine-type generator operated at 200 r.p.m. The generator rotor was mounted on a coupled extended shaft and two of the units were installed in the plant. The specifications of the engine, as furnished by the builders, was very weak as far as the crankshaft is concerned, reading as follows: Shaft will be a solid piece of open hearth steel of ample size and the crank provided with suitable cast-iron counter weights. There was an abrupt change of sections in the various parts and at one of the points where the flat section joins the round section the break occurred.

After the first engine finished had been in operation

for a week and a half, the crankshaft broke while running under normal load. The author was requested to make an analysis for carbon and a test for ultimate strength on two pieces that had been machined from the broken surface. The carbon was 0.25 and the ultimate strength was 50,000 to 55,000 lb. In the meantime the other engine had been put in commission. In one and a half weeks to a day, the crankshaft of this engine let go. An examination of the broken surface of the two shafts and a fracture made on two bars, one from the center and one from the side, machined from both of them, indicated that the shafts were castings and mighty poor ones at that. As the carbon on the second one was also 0.25, it was concluded that both of them had been cast from the same heat.

It was not until 1907, two years after the breaks occurred, that specimens were cut from the bars, one from the outside and one to represent the center, to be polished by hand and etched for study by means of a microphotograph. The structure of one of the crankshafts was compared with that of a known 0.30 carbon steel. The specimen of the center of the crankshaft was of a coarser structure than the outside, on account of its being the last to cool. The structure of a forged bar was also photographed, demonstrating still further that the shaft was a casting.

New Electric Tools

A line of high power electric tools which includes a combination grinding machine and several types of portable electric drilling machines has been developed and

Fig. 1—A Combination Bench and Tool Post Grinding Machine Built by the Standard Electric Tool Company, Cincinnati, Ohio

placed on the market by the Standard Electric Tool Company, Cincinnati, Ohio. All of these machines have the motors ventilated by a forced air circulation secured by a special type of fan. Fig. 1 shows the grinding machine, while one of the drilling machines is illustrated in Fig. 2.

The grinding machines are made for tool post, bench and parallel work and a special feature in connection with the first is a base which converts it into a bench machine. This change, which doubles the range of work handled by the machine, is secured by removing the slide and placing the motor in a groove in the top of the base. This arrangement, it is emphasized, greatly adds to the value of this tool in a shop. Although it is absolutely necessary to have tool post grinding machines, at the same time they are used only at intervals, while with this combination constant service can be secured if desired. The bearings in this machine are of phosphor bronze and are adjustable for wear although if desired they can be furnished with ball bearings instead.

Dustproof ball bearings are supplied throughout in the drilling machines, which were designed with the idea to give a simple and strong construction and avoid a complicated and weak arrangement. The gears used in the drilling machines are of case hardened chrome nickel steel, and are mounted on ball bearings packed in grease. These machines are built in ⅜ and ½ in. sizes for both direct and alternating current, and in addition a ⅜-in. size for operation on either direct or alternating current is made. The capacity of the largest direct-current machine is reaming up to 7/16 in. in thick metal. The motors

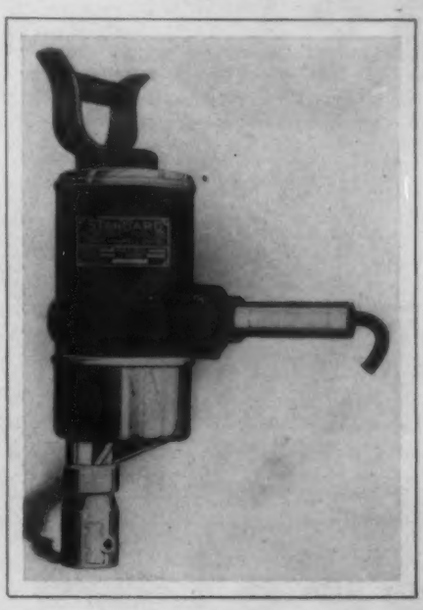
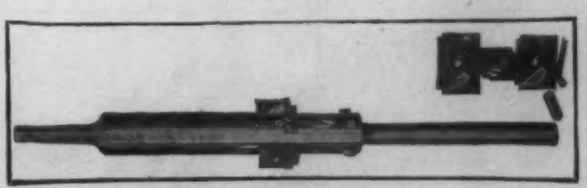


Fig. 2—The Improved Electric Drilling Machine of This Company

have an ample series winding, which enables them to develop power in excess of their rated capacity without burning out the armatures. The armatures and pole pieces in both machines are built up of soft electrical sheet steel stampings and are well insulated.

Hub Reaming Outfit

Increased output up to a maximum of 400 per cent. is the special feature claimed by the Kelly Reamer Company, Cleveland, Ohio, for the outfit recently installed in the Cleveland branch of the Liggett Spring & Axle Company, Monongahela, Pa. This boring and reaming outfit performs 10 operations at two chuckings. A recent change which has been made in the construction of the maker's standard reamer locates the blade more to the rear and enables a quick change to be made from the boring reamer body to the floating reamer without the removal of the bar side plates. In this way, as in cylinder reaming, it is possible to ream to approximately the finished size and then finish the opening to within 0.0001 in.



The New Hub Reaming Outfit Made by the Kelly Reamer Company, Cleveland, Ohio

of the actual finished dimension. Although designed primarily for the boring and reaming of hubs for automobiles, it is also possible to handle other work of a similar nature with this tool.

The Reed Hardware & Mfg. Company, Cairo, Ill., has been incorporated with $20,000 capital stock to take over the business of the Cairo Foundry & Machine Shops and the Cairo Iron & Machine Supply Company, formerly owned and operated by the late J. B. Reed. The new company will conduct a general iron and hardware business and will continue the foundry and machine shops along the same lines as inaugurated by Mr. Reed in 1862. The energies of the business are principally devoted to the output of the Reed lathes and the Hoo-hoo saw grinders and gummers. The officers of the company are Frank S. Reed, president and treasurer; E. R. Reed, vice-president, and Joseph H. Reed, secretary.

Large Electric Crane

Details of a Recent Product of the Shaw Electric Crane Company

What is claimed to be the largest electric traveling crane ever built has been recently installed in the Conway, Pa., shops of the Pennsylvania Railroad by the Shaw Electric Crane Company, Muskegon, Mich. Its lifting capacity is 200 tons and as will be noticed from the accompanying engraving the design is massive throughout. The crane is also interesting as indicating the steps taken by builders of this class of apparatus to keep pace with the increasing demands of manufacturing plants for cranes to handle and convey material of great weight and heavy equipment. This demand probably is a maximum in railroad shops, where the crane service required for handling and hoisting heavy loads such as the modern powerful locomotives and the all-steel equipment used in passenger and freight service, is severe. Fig. 1 is a general view of the crane as it appeared in the builder's shop, while one of the trolleys is shown in Fig. 2.

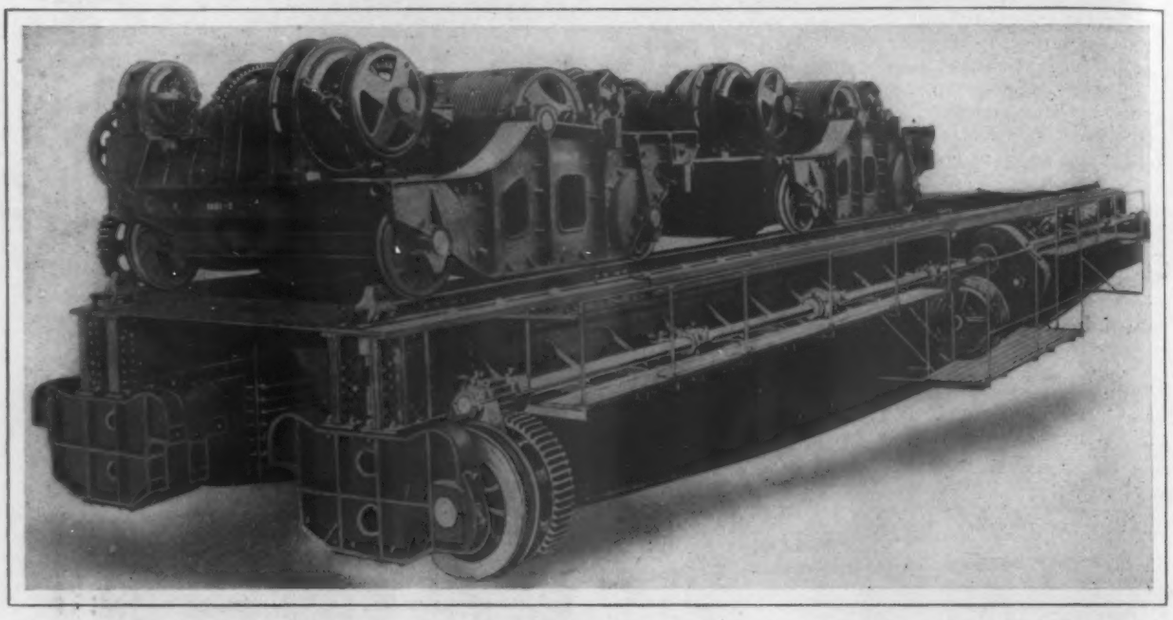


Fig. 1—The 200-Ton Electric Crane Recently Built for the Pennsylvania Railroad by the Shaw Electric Crane Company, Muskegon, Mich.

As will be noticed from Fig. 1, the bridge consists of two heavy box girders, each mounted on a cast-steel truck beam, each of which has two wheels so that the entire load is distributed on eight wheels. To equalize the distribution of the load upon these wheels a flexible steel member is employed to join the two box girders together near the top. The wheels, which are 36 in. in diameter, are double flanged and have steel tires, and the bearings are of the standard M C B type. The girders, which are approximately 80 in. deep at the center, are stiffened against lateral deflection and are also notched out to fit the truck beams, a type of construction which, it is pointed out, insures great rigidity. In attaching the girders to the truck beams fitted through bolts are employed.

The gears used throughout are of steel with the teeth cut from the solid, and those which drive the bridge at high speed and operate the hoist are fully inclosed in oil-tight cases. The bridge driving pinions have a bearing on each side to insure rigidity, and flange couplings are used on the line shaft. Two heavy steel side castings of I-beam section joined together by a machinery steel girt are used for the trolley frames. This type of construction is clearly brought out in Fig. 2. Bronze bush-

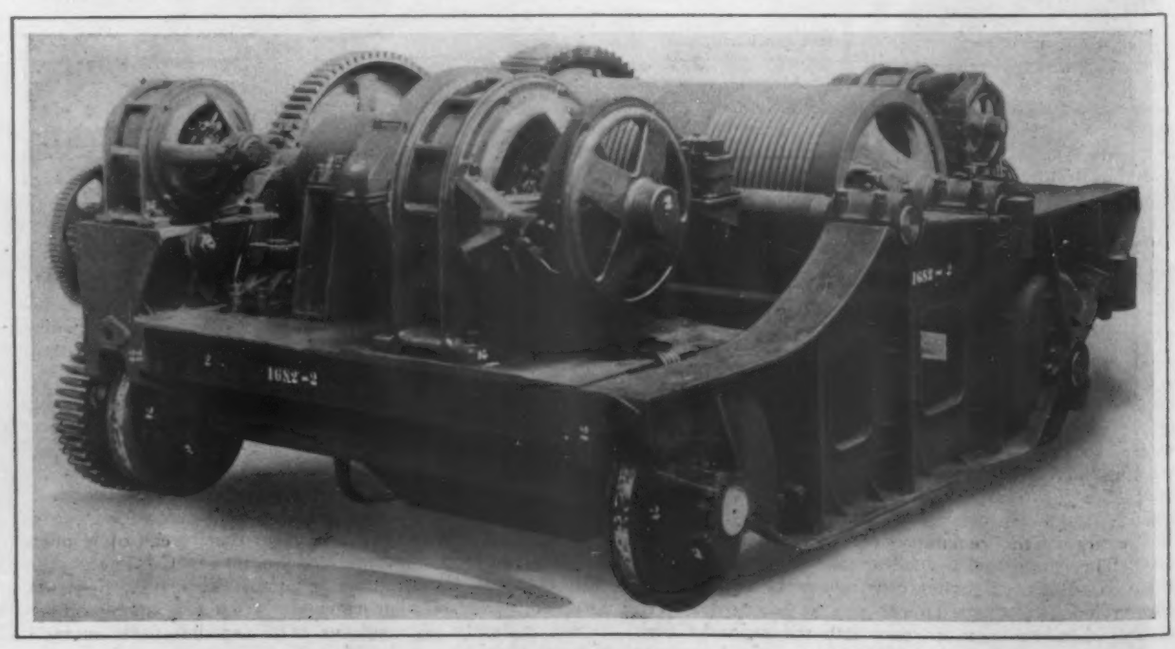


Fig. 2—View of One of the Trolleys Used with this Crane

ings are used for all the bearings, and those for the trolley truck wheels are of the M C B design. Like the bridge wheels, the wheels in this truck have double flanges and run on 90-lb. standard rails. The lubrication is secured by oil collars. In the design of the trolley care was taken to lay out the shafting so that any one section could be removed without interfering with any other, an arrangement which makes all of the parts very accessible. Each of the main hooks is suspended on 12 1⅜-in. flexible wire ropes while the auxiliary ones are each carried by four ¾-in. wire ropes.

Although the capacity of the crane is 200 tons, each of the trolleys has handled a test load of 130 tons, which makes the total load of the machine 260 tons. Each trolley has a 10-ton auxiliary hoist which operates at a full load speed of 22 ft. per minute. These hoists are driven by 22-hp. motors at a speed of 650 r. p. m. The crane is equipped with three-phase, 60-cycle, 220-volt General Electric motors, the main hoist and bridge motors having a capacity of 82 hp. at a speed of 485 r. p. m. The speed of the main hoist at full load is 7½ ft. per minute, and that of the bridge is 200 ft. per minute. The motor operating the trolley on the bridge is a 22-hp. unit and its speed is the same as that of the auxiliary hoist, 650 r. p. m. The speed of the trolley traverse is 100 ft. per minute. The span of the crane is 74½ ft. and the lift is 25 1/3 ft. The gross weight is approximately 300,000 lb.

New Boiler Tube Expander

A quick-acting sectional boiler tube expander has been placed on the market by the J. Faessler Mfg. Company, Moberly, Mo. The especially new feature is the mandrel extractor, a sleeve fitting loosely over the mandrel and having an extended arm to receive the blows of the hammer. The advantage claimed for this arrangement is that the force of each blow goes partly to the expander sections to free them from the mandrel, while the remainder goes to the side of the mandrel to loosen it sidewise without marring. This arrangement, it is claimed, is a decided improvement over the ordinary method of forcing out sectional expander mandrels by side blows from a hand hammer, which are bad for the tubes, the mandrel and the expander sections, and are also a source of expense and delays for the renewal of broken expander parts. Fig. 1 is a view of the expander, while the arrangement of the expander with the hammer applied to the mandrel extractor is illustrated in Fig. 2.

The expansion of the tubes with this new tool is ac-

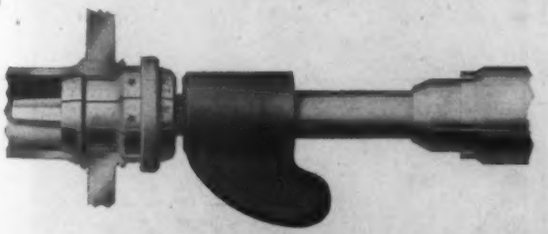


Fig. 1—The New Safety Sectional Tube Expander Made by the J. Faessler Mfg. Company, Moberly, Mo.

complished in the ordinary way with the standard long taper mandrel, as shown in Fig. 1. It is pointed out that the extractor does not interfere in any way with the expansion of the tubes, and to save time it may remain upon the mandrel. After the expansion is completed the loosening and extraction of the mandrel does not require the use of a flogging hammer where pneumatic tools are employed. The operator merely shifts the point of application of the hammer from the rear end of the mandrel to the end of a lug on the extractor collar, as shown in Fig. 2. The mandrel then releases itself almost instantaneously and backs out of the tube more rapidly than it went in.

Theoretically, each hammer blow forces the collar against the adjacent expander segment and moves it longitudinally before the remainder of the segments are affected. The contact of the collar and the expander segments also affords a fulcrum, over which the entire sleeve moves to impart a slight lateral impulse to the mandrel. This also tends to break contact with the expander segments, and where the mandrel is driven by a hand hammer

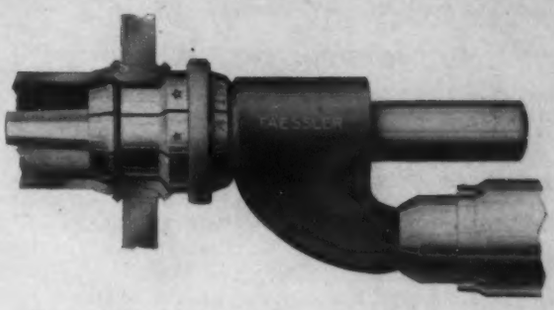


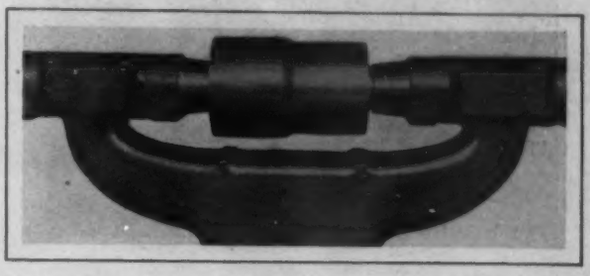
Fig. 2—The Hammer Applied to the Mandrel Extractor

a few taps of the latter upon the extractor lug are effective.

In use it is claimed by the manufacturer that this new tool operated by one man can expand more flues in a given time than two men working with an ordinary tool, while at the same time the expansion of the tubes is better and the danger of accident is practically eliminated.

Improved Polishing Machine

Among the improvements recently made by the Builders Iron Foundry, 9 Codding street, Providence, R. I., in its 12 and 14 in. ring oiling polishing machine, probably the most important is the change in the arrangement of the tight and loose driving pulleys. It will be noticed in this new arrangement, which is clearly brought out in the accompanying engraving, that the diameter of the loose pulley is ½ in. less than that of its mate, but it is prop-



View of the Spindle Showing the Improvement Made in the Pulley Construction of the 12 and 14 In. Polishing Machines Built by the Builders Iron Foundry, Providence, R. I.

erly stepped up to the tight pulley so that no difficulty is experienced in shifting the belts. The advantage claimed for this change is that an extra tight belt, which is necessary in polishing, can now be used wihout strain on the loose pulley, and as a consequence the wear on both the belt and the loose pulley is reduced. In addition to this advantage, when the machine is running there is also a saving in the amount of attention required by the belt, and it is further emphasized that loss in production in shutting down the machine or repairing the belt is also done away with. The lubrication of these machines is secured by the maker's standard arrangement of ring oilers, which, it is pointed out, enables them to be run at high speeds without difficulty due to poor lubrication.

The city of New London, Conn., is to receive $1,000,000 from the State, by act of legislature, for the building of docks and seawalls for the accommodation of ocean liners, and the work will commence as soon as possible. A number of steamship companies have announced their willingness to make New London their American terminal. The exceptional harbor and the comparative proximity to New York and other great centers are the reasons given for changing from New York.

The status of the gas producer and of the internal-combustion engine in the utilization of fuels is the subject-matter of Technical Paper No. 9, of the Bureau of Mines, Department of the Interior, Washington, D. C. The paper is issued under the authorship of Dr. Robert H. Fernald and comprises some 40 pages. It discusses, among other things, different gas producer fuels and the Diesel engine, the gas turbine and the Humphrey pump.

John C. Jay, Jr.

Newly Appointed Head of the Pennsylvania Steel Company's Sales Department

Announcement was made last week of the appointment of John C. Jay, Jr., as acting general manager of sales of the Pennsylvania Steel Company at Philadelphia, to succeed H. F. Martin, who has resigned. Born 32 years ago, Mr. Jay received his education in St. Paul's School, Concord, N. H., and at Williams College, from which he graduated in 1901. He entered the works of the Pennsylvania Steel Company at Steelton, Pa., in July, 1901, as an apprentice. In 1902 he was transferred to the New York sales office, then in charge of Stephen W. Baldwin. Mr. Jay was appointed manager of the New York office in May, 1906. His

JOHN C. JAY, JR.

transfer to the general offices of the company at Philadelphia is effective August 1. Mr. Jay is a great-great-grandson of Chief Justice John Jay. He is a member of the University Club and the Railroad Club, New York, and of the Sons of the Revolution and is general secretary of the Alpha Delta Phi fraternity.

Rail Seams and Laminations

A Suggestion that Ingot Molds Be Constantly Jarred During the Operation of Casting

Defects in steel rails can largely be prevented by the carrying out of a simple process during the casting of ingots—a process which would result in the elimination of laminated seams and streaked metal—according to a statement on this subject submitted to *The Iron Age* by Horace W. Lash, president the Garrett-Cromwell Engineering Company, Cleveland, Ohio. The report James E. Howard, engineer-physicist of the Bureau of Standards at Washington, has made to the Interstate Commerce Commission on the broken rail that caused a wreck on the Great Northern Railroad, and published in *The Iron Age* of July 11, 1912, led Mr. Lash to comment on this matter. In his report Mr. Howard stated that when seaminess and lamination of rolled steel shall have been eliminated a very important advance will have been made in steel rail manufacture. In stating his conclusions as to the Great Northern wreck, he said that such metal has been the direct cause of the fracture of many rails, that it is doubtless present in many rails now in service and that such rails are a menace to the safety of travel. Streaked and laminated metal are largely blamed for defective rails. Another statement is that the defects in part have their origin in the metal while it is in the state of the ingot. Mr. Lash's comment follows:

"The shrink holes of cavities formed in the upper portion of steel ingots during casting and solidification are largely responsible for the many defects found in steel rails. These cavities may be avoided or removed by liquid forging of the steel ingots during casting. This forging is a very simple process and can be accomplished by placing the molds with the small and closed end downward on a jarring machine, the latter to be kept in constant operation during casting and solidification. The effect will be to force the semi-liquid metal inward and downward into solid mass and thereby prevent the formation of all cavities and pipes. The result will be a solid ingot free from the defects which are the direct cause of the deadly laminated seams and streaked metal so often found in steel rails and other finished products."

Segregation in Low Carbon Steel

Professors Heyn and Bauer of the Royal Testing Laboratories at Gross-Lichterfelde West, Germany, have a short but interesting article in Stahl und Eisen on a case of segregation. Two sections of defective tube, 0.87 in. out-

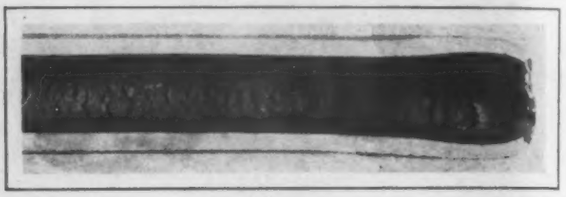


Fig. 1—Section of Tube Showing Tears

side diameter, were brought to the office for examination. The interior wall showed many cracks and tears. One sample was cut longitudinally, and the defects are clearly shown in Fig. 1. A ring was cut from the other section, polished and etched with copper ammonium-chloride solution. The etched section, somewhat magnified, is shown in Fig. 2, where may be seen a clear outer zone, R, free

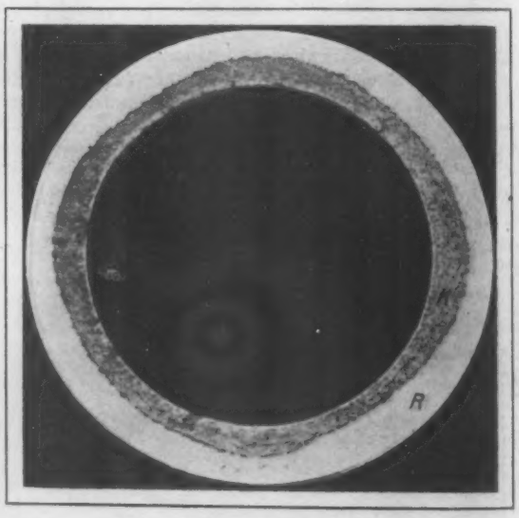


Fig. 2—Etched Cross-Section of Tube

from segregation, and a dark inner zone, K, rich in segregate. To confirm this, drillings were taken and analysis gave the following results:

	Phosphorus.	Sulphur.
Outer zone	0.029 per cent.	0.026 per cent.
Inner zone	0.069 per cent.	0.086 per cent.

The tearing of the tube during cold drawing is in all probability due to the difference in ductility of the two zones R and K, which is caused by segregation. G. B. W.

The Massillon Rolling Mill Company, Massillon, Ohio, will enlarge its plant by the erection of an extension, 100 x 320 ft. Several new sheet mills will be installed. The company devotes its attention largely to the manufacture of special sheets.

American Iron and Steel Institute Membership

Secretary James T. McCleary states that the present membership of the American Iron and Steel Institute is over 600. He furnishes the following list of those elected to membership since May 1, 1912:

Abbott, Franklin E., chief inspecting engineer Lackawanna Steel Company, Buffalo.

Alder, Thomas P., treasurer United States Steel Products Company, 30 Church street, New York.

Allderdice, Taylor, second vice-president National Tube Company, Pittsburgh.

Allen, Alonzo F., secretary and assistant treasurer American Steel & Wire Company, 72 West Adams street, Chicago, Ill.

Allen, Anson W., superintendent open hearth department Tennessee Coal, Iron & Railroad Company, Birmingham, Ala.

Allen, Chas. L., general manager and secretary Norton Company, Worcester, Mass.

Armstrong, Eliot, assistant to general manager sales Lackawanna Steel Company, Buffalo, N. Y.

Austin Harry L., J. Brooks Fenno & Co., Frick Building, Pittsburgh.

Baird, Chas. W., secretary and treasurer Detroit Iron & Steel Company, 149 Jefferson avenue, Detroit.

Baldridge, Wm. H., vice-president and eastern sales manager Phillips Sheet & Tin Plate Company, 50 Church street, New York.

Ball, Edwin, general superintendent mining department Tennessee Coal, Iron & Railroad Company, Brown-Marx Building, Birmingham.

Balsinger, Webster R., assistant to president Carnegie Steel Company, Carnegie Building, Pittsburgh.

Banks, A. F., president Elgin, Joliet & Eastern Railway Company, Chicago, Ill.

Barbour, H. H., New York sales agent Lackawanna Steel Company, 2 Rector street, New York.

Barr, Chas. J., general superintendent Ensley Division Tennessee Coal, Iron & Railroad Company, Ensley, Ala.

Barrett, Jacob C., superintendent blast furnaces Carnegie Steel Company, Ohio Works, Youngstown.

Bates, Daniel Nicholas, traffic manager American Sheet & Wire Company, 94 Grove street, Worcester, Mass.

Beale, Addison H., manager Vandergrift United American Sheet & Tin Plate Company, Vandergrift, Pa.

Bennett, Chas. W., assistant to president American Sheet & Tin Plate Company, Frick Building, Pittsburgh.

Bent, Quincy, assistant to president Maryland Steel Company, Sparrows Point, Md.

Bihler, Louis C., traffic manager Carnegie Steel Company, Carnegie Building, Pittsburgh.

Blass, Talmadge, superintendent coke department Lackawanna Steel Company, Buffalo.

Block, L. E., vice-president Inland Steel Company, Chicago.

Boley, Ernst, assistant to general superintendent American Steel & Wire Company, Western Reserve Building, Cleveland.

Bonner, James B., manager of sales Carnegie Steel Company, Pennsylvania Building, Pittsburgh.

Bourne, B. F., 805 Hickox Building, Cleveland, president Bourne-Fuller Company.

Borie, Adolphe E., vice-president Taylor Iron & Steel Company, 100 Broadway, New York.

Breeman, Wm., district sales manager Lackawanna Steel Company, Philadelphia.

Brown, Edwin Corner, chief civil engineer Carnegie Steel Company, Carnegie Building, Pittsburgh.

Brown, Hazen, assistant superintendent Lackawanna Steel Company, Buffalo.

Bryan, C. W., chief engineer American Bridge Company of New York, 30 Church street, New York.

Buck, Chas. Edw., manufacturer pig iron, 1103 Chestnut street, Chattanooga.

Buck, Daniel M., chemist and metallurgist American Sheet & Tin Plate Company, Frick Building, Pittsburgh.

Budd, Russel B., manager wire department United States Steel Products Company, 30 Church street, New York.

Burden, Jr., I. T., 65 East Seventy-eighth street, New York.

Burnett, Frank H., general purchasing agent Lackawanna Steel Company, Buffalo.

Burnett, Levi H., assistant to president Carnegie Steel Company, Pittsburgh, Pa.

Byers, E. M., manufacturer iron pipe, 235 Water street, Pittsburgh.

Callen, John Maurice, assistant general manager Reading Iron Company, Reading, Pa.

Campbell, Louis J., assistant to president Youngstown Sheet & Tube Company, Youngstown, Ohio.

Carey, Augustus W., traffic manager Tennessee Coal, Iron & Railroad Company, Birmingham, Ala.

Carnahan, Robert B., vice-president American Rolling Mill Company, Middletown, Ohio.

Carney, Frank D., general superintendent Pennsylvania Steel Company, Steelton, Pa.

Carpenter, Henry A., vice-president Riter-Conley Mfg. Company, Pittsburgh.

Carroll, Walter C., assistant general manager sales American Sheet & Tin Plate Company, Pittsburgh.

Carse, David B., director Lehigh Coke Company, 165 Broadway, New York City.

Chandler, John C., district sales agent Lackawanna Steel Company, Cleveland.

Chauvenet, S. H., general manager Berkshire Iron Company, Sheridan, Pa.

Clark, Eugene B., vice-president American Sintering Company, Chicago.

Clyde, Wm. Gray, assistant general manager sales Carnegie Steel Company, Pittsburgh.

Coakley, John A., division freight agent American Steel & Wire Company, Cleveland.

Collins, John P., assistant general superintendent Lucy Furnace Carnegie Steel Company, Pittsburgh.

Connell, Wm. H., treasurer American Bridge Company of New York, Pittsburgh, Pa.

Conrad, Wm. R., assistant treasurer Carnegie Steel Company, Pittsburgh.

Corbett, Willeby T., manager rail department United States Steel Products Company, 30 Church street, New York City.

Cordes, Chas. L., division freight agent American Steel & Wire Company, Pittsburgh.

Corey, Jr., Alfred A., assistant general superintendent Homestead Works Carnegie Steel Company, Munhall, Pa.

Crawford, E. R., president McKeesport Tin Plate Company, McKeesport, Pa.

Crockard, Frank Hearne, vice-president Tennessee Coal, Iron & Railroad Company, Birmingham.

Croxton, Samuel W., Rockefeller Building, Cleveland.

Cummings, Silas H., manager in plate department United States Steel Products Company, 30 Church street, New York City.

Cushman, Dr. Allerton S., director Institute of Industrial Research, Washington, D. C.

Dailey, Chas. I., assistant to general superintendent American Steel & Wire Company, Pittsburgh.

Damerel, Geo., sales agent American Tube & Stamping Company, 258 Broadway, New York City.

Davies, Geo. C., sales manager foundry department Pilling & Crane, Philadelphia.

Davis, Arthur L., division contracting manager American Bridge Company of New York, 30 Church street, New York.

Davis, Geo. F., vice-president Interstate Iron & Steel Company, Chicago.

Davis Henry J., general superintendent Clairton Steel Works Carnegie Steel Company, Clairton, Pa.

Davis, Wm. Owen, division freight agent American Steel & Wire Company, Chicago.

Dawson, Thos. W., assistant chief engineer H. C. Frick Coke Company, Scottdale, Pa.

Day, Friedel D., freight claim agent American Steel & Wire Company, Chicago.

Day, Geo. E., secretary and general manager Youngstown Sheet & Tube Company, Youngstown, Ohio.

Dennis, Montrose S., purchasing agent American Sheet & Tin Plate Company, Pittsburgh.

Dewey, Bradley, chief research laboratory American Sheet & Tin Plate Company, Pittsburgh.

Diehl, Ambrose N., superintendent blast furnaces Carnegie Steel Company, Duquesne, Pa.

Dietrick, Jas. W., general manager operating departments Republic Iron & Steel Company, Youngstown.

Dinkey, Chas. E., general superintendent Edgar Thomson Works Carnegie Steel Company, Bessemer, Pa.

Dowling, Martin J., assistant manager Jones & Laughlin Steel Company, Pittsburgh.

Driggs, L. L., New York agent United Steel Company, 90 West street, New York City.

Driscoll, Daniel J., president Delaware Seamless Tube Company, Auburn, Pa.

Early, Geo. P., special agent American Sheet & Tin Plate Company, Pittsburgh.

Eaton, Wm. H., sales manager American Sheet & Tin Plate Company, Chicago.

Edwards, J. H., chief engineer American Bridge Company of New York, 30 Church street, New York City.

Estep, H. Cole, associate editor Iron Trade Review, Chicago.

Fairbairn, Chas. T., manager southern district Republic Iron & Steel Company, Birmingham, Ala.

Fedder, Walter P., manager order department United States Steel Products Company, 30 Church street, New York City.

Foote, Geo. C., director Witherbee, Sherman & Co., Port Henry, N. Y.

Foster, Jas. H., president Hydraulic Pressed Steel Company, Cleveland.

Freeman, Stanton S., blast furnace manager Carbon Iron & Steel Company, Limited, Parryville, Pa.

Fuller, Fred M., assistant general manager of sales, Pittsburgh, American Sheet & Tin Plate Company.

Fuller, H. A., president Upson Nut Company, Cleveland.

Gassman, Howard Main, electrical engineer Tennessee Coal, Iron & Railroad Company, Ensley, Ala.

Gautier, Dudley G., 50 Church street, New York City.

Glasgow, Walter H., assistant to general superintendent H. C. Frick Coke Company, Scottdale, Pa.

Graham, Frederick F., secretary Lackawanna Steel Company, Buffalo.

Grange, Augustus B., assistant special agent American Sheet & Tin Plate Company, Pittsburgh.

Gray, Leslie J., assistant to general superintendent American Steel & Wire Company, Pittsburgh.

Greenwood, Hardy, sales agent for iron and steel manufacturers, Dallas, Texas.

Gresham, Wm. B., manager Lorain department United States Steel Products Company, 30 Church street, New York City.

Grose, Jas. H., superintendent Ohio Works Carnegie Steel Company, Youngstown, Ohio.

Haarbye, Storm B., assistant chief engineer American Sheet & Tin Plate Company, Pittsburgh.

Hadley, Walter E., assistant superintendent blast furnaces Tennessee Coal, Iron & Railroad Company, Ensley, Ala.

Hagar, Guy A., district sales manager Lackawanna Steel Company, Buffalo, N. Y.

Hale, Samuel, vice-president Wisconsin Steel Company, Chicago.

Hall, Francis J., general sales agent Central Iron & Steel Company, Harrisburg, Pa.

Hallman, Geo. F. D., purchasing agent Reading Iron Company, Reading, Pa.

Hamilton, Edw. J., assistant general superintendent Duquesne Works Carnegie Steel Company, Duquesne, Pa.

Hannan, Geo. W., general manager Phillips Sheet & Tin Plate Company, Weirton, W. Va.

Hansen, John M., president Standard Steel Car Company, Pittsburgh.

Hartsuff, O. J. H., superintendent New Castle Works Carnegie Steel Company, New Castle, Pa.

Hastings, Jas. L., district purchasing agent American Steel & Wire Company, Chicago.

Hearding, John H., assistant general manager Oliver Iron Mining Company, Duluth.

Heitman, F. A., president F. W. Heitman Company, Houston, Texas.

Hench, Lyman J., assistant to district sales manager Lackawanna Steel Company, Chicago.

Herndon, Edw. L., treasurer Eastern Steel Company, Pottsville, Pa.

Higginson, J. P., treasurer Lackawanna Steel Company, Buffalo, N. Y.

Hobbs, Cecil H., assistant district sales manager Lackawanna Steel Company, Chicago.

Holmes, Carroll O., manager structural and plate department United States Steel Products Company, 30 Church street, New York.

House, Francis E., president Duluth & Iron Range Railroad, Duluth, Minn.

Hovey, Otis E., assistant chief engineer American Bridge Company, 30 Church street, New York City.

Howell, Herbert P., assistant to vice-president Carnegie Steel Company, Pittsburgh.

Howes, W. Earl, traffic manager Lackawanna Steel Company, Buffalo, N. Y.

Hoyt, 2d, Elton, Pickands, Mather & Co., Cleveland.

Hufnagel, Robert B., general superintendent Jones & Laughlin Steel Company, Pittsburgh.

Hughes, I. Lamont, superintendent Youngstown District bar mill departments Carnegie Steel Company, Youngstown, Ohio.

Hughes, John, general agent United States Steel Products Company, 30 Church street, New York City.

Hunt, Azor R., general superintendent Homestead Works Carnegie Steel Company, Munhall, Pa.

Hunter, John A., steam engineer American Sheet & Tin Plate Company, Pittsburgh.

Hyatt, Wm. E., manager New York City department United States Steel Products Company, 30 Church street, New York City.

Ingraham, Frederick, superintendent Rockdale Works American Steel & Wire Company, Joliet, Ill.

Jacobs, Ward J., president Shelby Iron Company, Hartford, Conn.

Jenks, Geo. S., manager order department American Sheet & Tin Plate Company, Pittsburgh.

Jenks, Isaac W., general manager bar and hoop division Carnegie Steel Company, Pittsburgh.

Jennings, Robert E., president Carpenter Steel Company, 100 Broadway, New York City.

Johnson, Jr., Joseph E., manager Lake Superior Iron & Chemical Company, Ashland, Wis.

Johnston, Chas. T., general manager sales Republic Iron & Steel Company, Youngstown.

Jones, Henry L., manager South American Department United States Steel Products Company, 30 Church street, New York City.

Kernohan, Robert B., assistant to general manager Jones & Laughlin Steel Company, Pittsburgh.

Kessler, Jr., John P., general agent Carnegie Steel Company, Pittsburgh.

Kimball, G. Cook, chief engineer American Sheet & Tin Plate Company, Pittsburgh.

Lamont, Robert P., president American Steel Foundries, Chicago.

Landgrebe, Karl L., superintendent blast furnaces Tennessee Coal, Iron & Railroad Company, Ensley, Ala.

Larrsen, C. G. Emil, assistant chief engineer American Bridge Company of New York, 30 Church street, New York City.

Laughlin, Jr., Geo. M., manager Soho Works Jones & Laughlin Steel Company, Pittsburgh, Pa.

Lee, Arthur H., superintendent blast furnaces Lackawanna Steel Company, Buffalo.

Leet, Geo. K., secretary to chairman United States Steel Corporation, New York City.

Lehman, John G., vice-president and general manager Bethlehem Foundry & Machine Company, South Bethlehem, Pa.

Lewis, John F., assistant general superintendent Edgar Thomson Works Carnegie Steel Company, Bessemer, Pa.

Lewis, Wm. H., general superintendent Aliquippa Works Jones & Laughlin Steel Company, Woodlawn, Pa.

Lilly, Eugene Guy, assistant superintendent of open hearth Tennessee Coal, Iron & Railroad Company, Ensley, Ala.

Llewellyn, Jas. S., production manager Chicago Malleable Castings Company, West Pullman, Ill.

Llewellyn, Silas J., president Interstate Iron & Steel Company, Chicago.

Luce, Wilson A., assistant general manager Ellsworth Collieries Company, Ellsworth, Pa.

Lutz, Chas. W., superintendent Birmingham Works American Steel & Wire Company, Birmingham.

McCausland, Wm. C., treasurer Carnegie Steel Company, Pittsburgh.

McClelland, Dilworth B., vice-president and treasurer Spang, Chalfant & Co., Pittsburgh.

McCrea, Archibald M., president Union Spring & Mfg. Company, 50 Church street, New York City.

McGonnagle, Wm. A., president Duluth, Missabe & Northern Railroad, Duluth.

McGrady, John Wm., manager producing department Homestead Works Carnegie Steel Company, Munhall, Pa.

McKillips, James B., assistant auditor Carnegie Steel Company, Pittsburgh.

McLauchlan, Jay C., district sales manager Lackawanna Steel Company, Detroit.

McLauchlan, Wm., Pickands, Mather & Co., Cleveland.

McLean, John H., general manager Oliver Iron Mining Company, Duluth.

McLeod, John, assistant to president Carnegie Steel Company, Pittsburgh.

Maccoun, Andrew E., superintendent Edgar Thomson Blast Furnaces Carnegie, Steel Company, Braddock, Pa.

Mack, Augustus F., freight agent United States Steel Products Company, 30 Church street, New York.

Maeder, Carl E., superintendent Bessemer rolling mills Tennessee Coal, Iron & Railroad Company, Bessemer, Ala.

Mann, August, superintendent Anderson Works American Steel & Wire Company, Anderson, Ind.

Marsteller, Orville A., superintendent converting and mixer department Tennessee Coal, Iron & Railroad Company, Ensley, Ala.

Martin, Simon S., superintendent Maryland Steel Company, Sparrows Point, Md.

Mather, Amasa S., Pickands, Mather & Co., Cleveland.

Mather, Samuel L., assistant secretary Cleveland-Cliffs Iron Company, Cleveland.

Matheson, Jr., Geo., general manager Spang, Chalfant & Co., Pittsburgh.

Mathias, Wm. G., assistant general superintendent Ensley Works Tennessee Coal, Iron & Railroad Company, Ensley, Ala.

Mekeel, David L., chief engineer Jones & Laughlin Steel Company, Pittsburgh.

Merriman, D. A., assistant general sales agent American Steel & Wire Company, Chicago.

Meyers, Frederick, manager tube department United States Steel Products Company, 30 Church street, New York City.

Mills, Jas. R., manager of sales Carnegie Steel Company, New Orleans, La.

Mohr, J. A., superintendent Carrie furnaces Carnegie Steel Company, Rankin, Pa.

Molleson, Geo. E., manager railway department Tyler Tube & Pipe Company, 50 Church street, New York City.

Morris, Harrison S., president Wharton Steel Company, Philadelphia.

Morris, Leigh B., district sales manager Cambria Steel Company, 165 Broadway, New York City.

Moss, John B., assistant manager American Steel & Wire Company, Worcester, Mass.

Murray, Thomas, assistant secretary United States Steel Corporation, New York City.

Murray, W. P., Pickands, Mather & Co., Cleveland.

Nagle, L. F., general sales agent Worth Brothers Company, Coatesville, Pa.

Nash, Albert L., iron factor, 99 John street, New York City.

Neale, John C., assistant general manager of sales Carnegie Steel Company, Pittsburgh.

Nicholson, John H., second vice-president Shelby Steel Tube Company, Pittsburgh.

Olcott, Wm. J., president Oliver Iron Mining Company, Duluth, Minn.

Parrish, Robert L., president Oriskany Ore & Iron Company, Covington, Va.

Parsons, Arthur C., chief chemist Lackawanna Steel Company, Buffalo, N. Y.

Patterson, Peter C., chief engineer National Tube Company, Pittsburgh.

Pendergast, Geo. A., sales department Lackawanna Steel Company, 2 Rector street, New York City.

Pickands, Henry S., Pickands, Mather & Co., Cleveland.

Pike, Chas. W., district sales manager Lackawanna Steel Company, San Francisco.

Pinkerton, Andrew, electrical engineer American Sheet & Tin Plate Company, Pittsburgh.

Piper, Arthur, chief inspector American Sheet & Tin Plate Company, Pittsburgh.

Putnam, Louis E., treasurer and general manager Ashland Steel Company, Ashland, Ky.

Quarrie, Bertram D., general superintendent Newburgh Steel Works and Furnaces, Newburgh, Ohio.

Raymond, Henry A., Cleveland-Cliffs Iron Company, Cleveland.

Robbins, Merton C., general manager *The Iron Age*, New York City.

Robinson, Alex. P., vice-president Cambria Steel Company, Philadelphia.

Rodgers, S. M., metallurgist American Steel & Wire Company, Pittsburgh.

Ross, Lewis P., blast furnace manager Northern Iron Company, Standish, N. Y.

Rownd, Harry L., vice-president and treasurer Republic Iron & Steel Company, Youngstown.

Rummel, Geo. F., assistant general sales agent American Steel & Wire Company, Chicago.

Ryding, H. C., assistant to vice-president Tennessee Coal, Iron & Railroad Company, Birmingham.

Rys, C. F. W., metallurgical engineer Carnegie Steel Company, Pittsburgh.

Scott, Geo. C., manager Asiatic department United States Steel Products Company, 30 Church street, New York City.

Scott, Jas., general superintendent Isabella and Lucy furnaces Carnegie Steel Company, Pittsburgh.

Scott, John R., general manager sales Carnegie Steel Company, Cleveland.

Schleiter, Walter F., vice-chairman and secretary Dilworth, Porter & Co., Pittsburgh.

Schlesinger, Armin A., iron ore mining and iron manufacturing, Milwaukee.

Schlesinger, Ferdinand, iron ore mining and iron manufacturing, Milwaukee.

Schlesinger, Henry J., iron ore mining and iron manufacturing, Milwaukee.

Schotter, Harry L., general superintendent City Mills Carnegie Steel Company, Pittsburgh.

Sells, Geo. W., superintendent American Steel & Wire Company, Waukegan, Ill.

Shook, Geo. L., manager blast furnace Northern Iron Ore Company, Port Henry, N. Y.

Shuman, Jesse J., inspecting engineer South Side Works Jones & Laughlin Steel Company, Pittsburgh.

Sias, John M., assistant to vice-president United States Steel Corporation, 71 Broadway, New York City.

Sim, Jas., iron and steel business, 15 William street, New York City.

Skemp, Robert, assistant to vice-president American Sheet & Tin Plate Company, Pittsburgh.

Slick, Edwin E., chief mechanical engineer Carnegie Steel Company, Pittsburgh.

Sloane, Malcom D., secretary Eastern Steel Company, 60 Broadway, New York City.

Smart, Geo., editor Iron Trade Review, Cleveland.

Smith, Geo. W., Lackawanna Steel Company, Buffalo.

Smith, James W., manager Trenton Iron Company, Trenton, N. J.

Speller, F. N., metallurgical engineer National Tube Company, Pittsburgh.

Starke, A., manager order department Lackawanna Steel Company, Buffalo.

Stearns, Edw. B., assistant division contracting engineer American Bridge Company, 30 Church street, New York City.

Stephenson, Jas. I., president Cincinnati Iron & Steel Company, Cincinnati.

Stevens, Harold L., district sales manager Lackawanna Steel Company, Boston, Mass.

Stone, Walter C., assistant manager wire mills American Steel & Wire Company, Chicago.

Stratton, Wm. H., manager bridge department United States Steel Products Company, New York City.

Sullivan, Geo. M., manager sheet steel department United States Steel Products Company, 30 Church St., New York City.

Swayne, Noah H., 2d, manager of sales Rogers, Brown & Co., pig iron, Philadelphia.

Swift, Geo. D., assistant secretary Oliver Iron Mining Company, Duluth, Minn.

Taylor, Benjamin H., special agent Carnegie Steel Company, Pittsburgh.

Taylor, James M., purchasing agent Carnegie Steel Company, Pittsburgh.

Taylor, Knox, president Taylor Iron & Steel Company, High Bridge, N. J.

Taylor, Thomas H., assistant general sales agent American Steel & Wire Company, 30 Church street, New York City.

Temple, Thomas D., superintendent American Steel & Wire Company, DeKalb, Ill.

Tewkesbury, Elmer M., general superintendent South Buffalo Railway Company, Buffalo.

Thomas, Leon E., general manager Birdsboro Steel Foundry & Machine Company, Birdsboro.

Thomas, Rowland D., president Davies & Thomas Foundry Company, Catasauqua, Pa.

Thompson, David P., president Sharpesville Furnace Company, Cleveland.

Toomey, Howard C., president Philadelphia Steel & Wire Company, Philadelphia.

Unger, Dr. John S., manager research laboratory Carnegie Steel Company, Duquesne, Pa.

Van Schaick, Arthur P., district sales manager Lackawanna Steel Company, Chicago.

Vogel, Felix A., general manager Florence Iron Company, 25 Broad street, New York City.

Vogt, Chas. A., auditor American Steel & Wire Company, Cleveland.

Wadsworth, J. E., resident engineer American Bridge Company, 30 Church street, New York City.

Waldeck, Jay, superintendent North Works American Steel & Wire Company, Worcester, Mass.

Waterhouse, Geo. B., metallurgical engineer Lackawanna Steel Company, Buffalo.

Watson, Fred L., treasurer American Steel & Wire Company, Chicago.

Watson, Ralph H., superintendent open hearth department Homestead Works Carnegie Steel Company, Munhall, Pa.

Wayland-Smith, Richard, assistant manager sales Carnegie Steel Company, 30 Church street, New York City.

Weir, David M., vice-president Phillips Sheet & Tin Plate Company, Weirton, W. Va.

Wellman, Samuel T., chairman Wellman-Seaver-Morgan Company, Cleveland.

Wheeler, Seymour, assistant secretary Pickands, Brown & Co., Chicago.

Whigham, Wm., assistant to president Carnegie Steel Company, Pittsburgh.

Whitaker, Samuel H., assistant to managing director Dayton Coal & Iron Company, Cincinnati.

White, G. Arthur, metallurgist American Sheet & Tin Plate Company, Pittsburgh.

White, Reubens S., credit manager American Steel & Wire Company, Chicago.

Whitgrove, Frank J., superintendent Scott Street Works, American Steel & Wire Company, Joliet, Ill.

Wilkinson, Horace S., president Halcomb Steel Company, Syracuse, N. Y.

Williams, Edw. P., superintendent foundry blast furnaces Tennessee Coal, Iron & Railroad Company, Bessemer, Ala.

Wilmot, Frank A., metallurgical engineer and manufacturer, Bridgeport, Conn.

Winckler, Elmer E., assistant manager sales American Sheet & Tin Plate Company, 30 Church street, New York City.

Witherbee, Walter C., treasurer and director Witherbee, Sherman & Co., Port Henry, N. Y.

Wolfe, Wm. L., superintendent blast furnaces Lackawanna Iron & Steel Company, Lebanon, Pa.

Woods, Leonard G., vice-president Union Spring & Mfg. Company, Pittsburgh.

Worcester, Edw., first vice-president National Tube Company, Pittsburgh.

Wright, Philip E., sales agent Thomas Iron Company, Philadelphia.

Wright, Wilfred L., vice-president and general manager Tioga Steel Company, Philadelphia.

Young, Andrew G., traffic manager American Sheet & Tin Plate Company, Pittsburgh.

The Cement Products Exhibition Company, 72 W. Adams street, Chicago, announces that the principal "Cement Shows" for this year will be held at Pittsburgh and Chicago. The former will be held from December 12 to 18 in Exposition Hall, Duquesne Way, and the latter in the Coliseum, January 16 to 23, 1913. The selection of Pittsburgh is in keeping with the proposition that new territory where the use of concrete has a prospect for large development is the most fruitful field in which to sow the exhibition benefits.

Foreign Delegates to the International Testing Materials Congress

With the sixth congress of the International Association for Testing Materials only a little over five weeks away, details of the meetings and social arrangements are being completed and the list of foreign delegates to the meeting is fast growing in length. A general outline of the time of holding sessions and an enumeration of the excursions during the regular week of the congress, September 2 to 7, and also of the journey the following week to Washington, Pittsburgh and Niagara Falls, was given in *The Iron Age* of May 2. The headquarters of the congress will be the Engineering Societies Building, 29 West Thirty-ninth street, New York, where the sessions will be held. It is expected that 200 European members will participate, accompanied by 30 ladies and three princesses. The American attendance will probably number 500. Another bulletin giving detailed information is about to be issued by the secretary of the congress, H. F. J. Porter, 29 West Thirty-ninth street, New York.

It may here be emphasized that any person interested in the aims of the International Association for Testing Materials may become a member of the congress by payment of the current year's dues of the Association, $2, in addition to the fee for the Congress which is $5. Membership includes the privilege of presenting written or oral discussions, offering motions on technical questions and voting on technical resolutions; it also includes the privilege of participating in the excursions, receptions and other events without further charge and entitles the holder to receive the proceedings of the congress. The sessions of the congress will be conducted in English, German and French, with the aid of interpreters.

Among American papers, the following have been received: "The Effect of High Temperatures on the Physical Properties of Some Alloys," by I. M. Bregowsky and L. W. Spring, Crane Company, Chicago. This will report in detail the tensile strength, elastic limit, elongation and reduction of area of eighteen well-known alloys both ferrous and non-ferrous, and torsion tests of commercial rolled rods of fifteen alloys regularly purchasable on the market. "Standard Magnifications for Micrographs," by M. T. Lathrop and C. R. Bulley. "The Solid Non-Metallic Impurities in Steel," by H. D. Hibbard, who proposes the term "sonim" to designate what others have variously called entrained slag, occluded slag, entrained silicates, oxidation products, etc. "Insuring Soundness in Steel Rails," by Capt. Robert W. Hunt, Chicago, who advocates discarding the upper end of every ingot. He does not consider the size of rail section will reduce the importance of the question of soundness.

A list of the delegates from other countries to the congress is in part as follows:

Australia

W. H. Warren, P. N. Russell Engineering Laboratory, The University, Sydney, New South Wales.

Austria

Dr. Alfons Leon, Vienna.
Otto Zugmayer, Waldegg, Nied.
Rudolph Heller, Vienna.
Alfred Deinlein, Vienna.
Dr. August Gessner, ingenieur, Vorstandder der Versuchsanstalt der Skodawerke A.G. in Pilsen.
Bernhard Kirsch, Vienna.
Ernst Reitler, secretary International Association for Testing Materials, Vienna.
Prof. Otto Greger, Vienna.
Prof. Dr. Albert Stor, Royal Mining School, Pribram, Bohemia.
Julius Spitzer, Vienna.
Edwin Backer, Vienna.
Dr. Paul Hansel, director and manager Saxonian-Bohemian Portland Cement Mfg. Company, Tschischkowitz near Lobositz, Bohemia.

Belgium

Emile T. Camerman, chief chemist State Railway Administration, 31 Square-Guttenberg, Brussels.
P. Christophé, chief engineer Bridges and Roads, Brussels.

China

Kuo-Chi-Loo, Chinese Consulate, New York.

Denmark

Alexandre Foss, engineer and Chevalier of the Order of Danabrog.
A. G. v. Peterson, Copenhagen.
H. P. Prior, representing Electric Technical Society, Denmark, Copenhagen.
A. B. Reck, Capt. Royal Danish Engineers, Esromgade, Copenhagen.
E. Suenson, professor Technical School, Richsvej, 44, F., Copenhagen.
A. Jacobsen, mechanical engineer Danish Street Railways, Johnskups Allé 2, Copenhagen.
A. Bjerre, section engineer Bureau of Municipal Engineers in Copenhagen, Lyngley.
Jacob Marstrund, mayor Copenhagen, Ved Glyptotheket 6, Copenhagen, B.
A. Ponken, engineer Royal Danish Water Works, Leinvig.
E. Rung, lieutenant Royal Corps, Pilealle, 5 St. Kjabenhavn.
Q. E. Sclejerleck, department engineer Government Testing Laboratory, Strandboulevard 118, Copenhagen.
D. Berg, civil engineer, managing director Aalborg Portland Cement Fabrik, Aalborg.
Paul Larsen, city engineer, F. L. Smidth & Co., Vestergade 33, Copenhagen.
Henrik Pade, Northern Cable & Rope Company, Copenhagen, Fabrikvej.
M. H. Nyeboe, engineer, Roadhuspladsen 37, Copenhagen.
J. Weldelbo-Madsen, architect, Anker Heegaarsgade 2, Copenhagen.

France

M. Le Chatelier, inspector general of Mines.
M. Mesnager, chief engineer of Mines.
M. Feret, chief Roads and Bridges, Boulogne.
M. Malaval, engineer Naval Artillery.
M. Cellerier, director Testing Laboratory, Conservatoire des Arts et Métiers.
M. Fleurent, professor Industrial Chemistry, Conservatoire des Arts et Métiers.

Germany

Privy Councillor Monch, Imperial Marine Department.
Private State Councillor Jaeger, Prussian Ministry of Commerce and Trade.
Navy Councillor of Construction Schulz, Imperial Marine Department.
First Councillor of Construction Jahnke, Prussian Railway Administration.
Councillor of Industry Waetzoldt, commercial expert German Consulate General, New York.
Professor Heym, sub-director Royal Prussian Material Testing Bureau.
Professor Gary, Royal Prussian Material Testing Bureau.
Prof. Dr. Hinrichsen, Royal Prussian Material Testing Bureau.
Dr. Friedrich, representing Chief of Police, Berlin.
Prof. Dr. Ing. A. Martens, director Royal Testing Laboratory, Gross-Lichterfelde West.
Prof. Dr. Hirschwald, Privy State Councillor, Berlin, Grunewald.
Frederich Barth, chief engineer Bavarian Land Office, Nürnberg.
Prof. E. Rich Eichhoff, professor Metallurgy of Iron, Charlottenburg, Berlin.
E. Bieske, engineer and town councillor, Konigsberg i/Pr.
Rolin, chief engineer, Dampfkessel-Revisions-Verein, Austria, Konigsberg i/Pr.
Rudolph Pfeiffer, consulting engineer of construction Royal Saxony Street Railways, Dresden A.
Th. Scharff, inspector Department of Buildings of the Police, Hamburg.

Great Britain

Dr. W. C. Unwin, F.R.S., president Institution of Civil Engineers, London.
Dr. Archibald Denny, Leven Ship Yard, Dumbarton, Scotland.
Bertram Blount, F.I.C., Westminster, London.
Sir Hugh Bell, Bart., Rounton Grange, Northallerton.
Sir Robert A. Hadfield, F.R.S., 22 Carlton House Terrace, London, S.W.
G. C. Lloyd, 28 Victoria street, London, S.W.
Leslie S. Robertson, 28 Victoria street, London, S.W.
J. Allen Howe, Museum of Practical Geology, Jermyn street London, S.W.
Dr. W. Rosenhain, Teddington, Middlesex.
E. O. Sachs, 8 Waterloo place, London, S.W.
Harry Brearley, The Amalgams Company, Ltd., Sheffield.
W. Cleland, Testing Works, Sheffield.
J. Davis, 64 Victoria street, London.
F. W. Harbord, London.
Edmund W. Janson, London.
Arthur L. Pearse, London.
Prof. C. W. O. L. Alexander, University College, Cork, Ireland
H. A. Brain, Naval Residences, Portland, England.
S. G. Robinson, 111 Palace Chambers, 9 Bridge street, Westminster, S.W.

Holland

Prof. P. D. C. Kley, professor Metallography, Technical High School, Delft.

L. Bienfait, mechanical engineer, director Testing Laboratory of Koning & Bienfait, Amsterdam.

A. A. Bienfait, secretary to L. Bienfait.

L. C. Westhoff, chief engineer Building Department, Holland Railway, Amsterdam.

P. Joosting, chief engineer Bridge Department, Netherlands State Railways, Utrecht.

P. C. J. Laumans, chief engineer Locomotive Department, Netherlands State Railways, Utrecht.

J. Verbrugh, The Hague.

Hungary

J. Marx, ministerial councillor, president Hungarian State Railways.

Prof. A. Rejtö, court councillor, professor Budapest University of Technical Sciences.

Prof. Const. Zielinszky, professor Budapest University of Technical Sciences.

Nicolaus Gerster, director Budapest State Institute for the Testing of Materials.

A. Fodor, chief engineer Public Works, Budapest.

J. Marx, president Hungarian State Railways.

J. Papp, court councillor, manager Hungarian State Railways.

J. Zelovits, manager Hungarian State Railways.

J. Bartel, Bauras, Budapest.

Satori Ceer, Fabrikant, Budapest.

Arnold Lowenstein, Budapest.

Roruel v Felovichy, Budapest.

Albert Grittner, Budapest.

Dr. Ing. W. Misangyi, Budapest.

Teodor Novak, Budapest.

Italy

Prof. Carlo Parvopassu, professor Engineering, Royal University of Padova, Padova.

Ciovanni Salemi Pace, School of Applied Engineering, Palermo.

Panetti Modesto, professor Polytechnic School, Turin.

Guido Perelli, director First Italian Association for the Manufacture of Steam Apparatus, Cappuccio 14.

Enrico Scifoni, Cav. Ing., Nobleman, S. Chiara 33, Rome.

Prof. Silvio Canevazzi, director Royal School of Engineering at Bologna.

Norway

N. C. Ihlen, former minister of state, president Norwegian Branch International Association for Testing Materials.

Gabriel Smith, director Harbors of Norway.

Dr. J. Gram, chemist Board of Managers, Norwegian State Railways.

Hans Tonnesen, engineer, acting constructor of bridges, Norwegian State Railways.

Russia

N. Belelubsky, privy councillor, engineer, professor emeritus Institute of Engineers of Ways of Communication of the Emperor Alexander I.

N. Boguslavsky, actual councillor of state, engineer, assistant director technical section of the Administration of Railways.

S. Kareicha, privy councillor, engineer, director and professor Institute of Engineers of Ways of Communication of the Emperor Alexander I.

D. Nowgorodsky, honorary councillor, acting engineer of the Assistant Chief of the Laboratory of the Institute.

Count Schaubenbourg, court councillor, engineer, assistant to chief engineer of the section for the examination and inspection of orders of the Ministry of Ways of Communication.

N. Chadrine, metallurgical engineer, attached to the section.

Capt. N. Beliaeff, lecturer metallurgy and chemistry, M. Artillery Academy of St. Petersburg.

Prof. T. Walden, Polytechnic Institute of Riga.

M. Paul Velikhoff, engineer, instructor Imperial Engineering School at Moscow.

Nicholas Lachtinn, Moscow, manager testing materials, Imperial Technical High School of Moscow; manager mechanical laboratory of Moscow School of Fine Arts.

M. Nicholas Lashtine, engineer, member of council Russian Society for Testing Materials; instructor Imperial Engineering School, Moscow.

N. Abramoff, mechanical laboratory Polytechnic Institute of Dan, Nowotscherlassk, Ratnaya 58.

J. Antokonenko, engineer-in-chief technical section of road maintenance, Department of the Transbaikal Railroad, Irkutsk, Degtewskaya 23/12.

Casimir Chafranko, engineer-in-chief of testing materials, Usine Poutiloff, St. Petersburg.

Alexander Czernay, engineer Polesski Railroads, Wilna.

Nicholas Davidenkof, Polytechnic Institute Mechanical Laboratory, St. Petersburg.

Woldemar Freyberg, railroad engineer, Lugowaja Str. 44, Irkutsk.

Prince Andrew Gagarin, 30, English quai, St. Petersburg.

Prince P. v. Lieven, St. Petersburg, Serguiewskaya 54.

Alexander Nastukoff, professor and delegate Imperial University of Moscow, Arbat, Nikolsky per, 10, 28, Moscow.

J. Savrimovitsch, colonel Military Engineers, Kronstadt, Nicolaewskaya, 1.

Serge Sissoeff, C. E., contractor for construction New Graving Dock, Cronstadt, 5 Litzeiskaya, St. Petersburg.

Johann Stchepovsky, engineer, Moscow.

W. Roubanoff, mechanical engineer, Ekatjerinoslaw, Rue de Gymnase.

C. E. Holmberg, professor, Helsingfors, Finland.

Servia

Douchan Thomitch, professor University at Belgrade and director Institute for Testing Materials.

Spain

Don Rudesindo Montoto y Barzal, commander of engineers, Laboratory of Materials of the Corps of Engineers.

Don Bienvenido Oliver, professor of qualities of materials School of Engineers, chief of the Section of Electricity, Central Laboratory for Testing Materials.

Don Enrique Colas, professor Inspection of Materials and General Construction, School of Assistants of Public Works.

Sweden

Johan August Brinell, chief engineer Iron Office.

John Oskar Roos, Hjelmsater, chief engineer and superintendent Department for Testing Materials, Technical High School, Stockholm.

Switzerland

Prof. F. Schule, Federal Technical High School.

Alfred Keller, chief mechanical engineer Swiss Federal Railroads in Berne.

Prof. Auguste Dommer, engineer, University of Lausanne.

Jules Weber, engineer and director Swiss Locomotive and Machine Factory, Winterthur.

A Southern Hydroelectric Development

J. G. White & Co., New York, are the engineers and contractors retained by the Georgia-Carolina Power Company on the hydroelectric development at Stevens Creek, on the Savannah River, about 9 miles northwest of Augusta, Ga. The power house will be on the Georgia side of the river, and for the ultimate installment its length will be about 360 ft. The length of the dam will be 2300 ft., the spillway section of which will be about 2000 ft. long. A lock about 30 x 150 ft. in the clear will be constructed for pole boat navigation. In the overflow section of the dam adjacent to the power line will be five waste gates about eight feet square. The average hight of the dam will be 34 ft. Flash boards three or four ft. high are to be provided.

The ultimate installation will be 18,000 kw. in 10 main units, with two 200 kw. water wheel driven exciter units and one 200 kw. motor driven exciter. The average head will be 27.3 ft. with extremes of 16 and 32 ft. The present installment will include five main and two exciter units.

Transmission lines will be constructed to Augusta, 10 miles, and from Augusta to Graniteville, S. C., 17 miles, making a total of 27 miles. The generation voltage will be 2300 and the line voltage will be 33,000. This work will be completed early in 1914, and the cost will be about $2,500,000.

Vanadium Steel.—The United Steel Company, Canton, Ohio, has issued a booklet of interest to all manufacturers who are watching the development of the vanadium steel industry. The contents are unusual, due to the fact that they are not merely a group of assertions, but form a text-book of tests demonstrating that chrome vanadium steel possesses most valuable properties. Illustrations show the result of different tests on springs, gears, axles, bars, etc., and the conditions are described under which tests were made. The United Steel Company was the pioneer in the manufacture of chrome vanadium steel and dating from the time of its introduction has specialized in the manufacture of this material. The business being one in which experience is a vital factor, the solution of breakage problems is one with which this company is well fitted to deal. It advises us that its technical department is at the service of all who are interested in strengthening those parts where light weight is essential.

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CONTENTS.

The Iron and Steel Situation

The prominence given in some recent statements concerning the iron and steel market to certain surface factors has to an extent obscured the actual status. The remarkable activity of the mills, the oversold condition of some and the congestion this has produced have been taken in some quarters to mean that a new situation has been created by recent buying. The fact is that a part of the recent buying—how much, it is difficult to measure—has been due to the oversold condition of particular mills and the necessity of placing elsewhere business which was really taken account of earlier in the year.

In comparing the buying of July with that of May and June, therefore, it is to be kept in mind that if the mills were heavily sold at the close of June, the consumers of steel products were at the same time, generally speaking, in the condition of having heavily bought. If the United States Steel Corporation's statement were an index of the whole trade, there was enough business ahead to run the mills until late in the year; indeed in some of the boom comment on the steel trade that has come out since July 1 it has been asserted without reserve that the Steel Corporation had enough business on its books to run its mills for six months without taking another order. That statement is plainly in error; otherwise the corporation could not have taken on the new orders that have been reported since July 1, which amount to a very respectable total. At the same time, it is well known that the Steel Corporation, with 5,800,000 tons of unfilled orders on its books July 1, and with little of this, apart from agricultural bars, scheduled for delivery next year, cannot now take on more than a fraction of this 5,800,000 tons in the form of strictly new business in the next six months and make deliveries this year.

To take another instance: The Lackawanna Steel Company in its statement for the first six months of this year shows unfilled orders on June 30 of 565,900 tons. As this company's largest output was 1,082,000 tons in 1910, and its capacity has been only slightly increased meantime, it would seem that its unfilled orders amount to practically six months' output. A western Pennsylvania steel company, to cite another case, has found that it is considerably oversold for deliveries in the next few months and is, therefore, temporarily out of the market. In the Chicago district it is reported that orders for finished material in the first half of July were about 50 per cent. of those for the first half of June, but that the percentage would have been higher if the mills had not been so fully sold ahead.

Attention has been repeatedly called in market reports of the past two months to the fact that the congestion at the mills is more marked in the case of plates than in any other product. This makes it possible now for the Eastern mills, which only two months ago were selling below the Pittsburgh basis, to get even better than Pittsburgh prices with freight added, on some business that is overflowing from the mills farther west. There is some evidence of congestion in structural material and in bars also, but it is not marked, and in the lighter products it is not a factor. In semi-finished steel it is evident that some mills will be under a good deal of strain to make the deliveries scheduled for the third quarter. Car works have been covered on the material for

new cars taken up to July 1, and on that date it is estimated that unfilled orders for 80,000 to 90,000 freight cars were on the books. At the rate these companies have been operating this year, it would take four or five months to work off this business. It is known that good car inquiries are pending, but it is a question how far any equipment placed in the next few weeks can be made available for this year's crop moving. The car companies have their working organization now gauged to a yearly output of, say, 175,000 cars, and the extent to which they can increase their forces in the face of the present labor scarcity will have much to do with their abi ity to take on the large car business which according to some views of the situation must be placed for delivery in the late months of the year.

The fact upon which the general steel market situation in the immediate future will turn—speaking of the conditions that are known, and not of political or other uncertainties—is the tremendous tonnage on the books of the mills. It is that which will call for sharply distinguishing between the rate at which new business is being placed and the rate at which the mills are running in discharging their heavy obligations to consumers. Some steel companies more freely committed themselves at the low prices than did others. In view of what has been written and put on record in the past year or two by various steel manufacturers on the importance of keeping contract obligations, it may be expected that an unusual effort will be made to fulfill all existing contracts. There are evidences that a good deal of difficulty on this score is ahead, but it is not clear what the final effect will be. Some of the shortages may be on contracts with merchant interests which bought heavily at the low prices, partly with a view to restocking. Such shortages will not be as effective in advancing prices as those which occur on contracts with manufacturers whose necessities may send them to other mills. It is evident, however, that on the three important products which were advanced late in June—plates, structural shapes and bars—the situation as to prices may be determined for a time by a relatively smal tonnage and that the tendency of such prices will be upward.

It must still be said that the great foundry industry is lagging behind, as it has done in all the nine months of activity in steel. Much of the consumption of steel in that time has been of a replacement character, and in compensation for the several preceding years of limited buying. The next stage is such a development of confidence as will warrant the launching of new enterprises and the extension of existing plant. When that comes foundries will be busy and the merchant pig iron market will show satisfactory volume and prices which have long been lacking. But until such a condition is seen it cannot be said that the iron and steel trades are experiencing what can truthfully be called a boom.

Our Exports of Iron and Steel Manufactures

So much attention has been directed to the spectacular increase in our exports of iron and steel products in recent months that it may not be generally realized that our exports of iron and steel manufactures have been growing apace. For convenience we may divide our iron and steel exports, excluding iron ore, into two general classes, tonnage and non-tonnage. The tonnage exports are those of which the weight is returned, and include scrap, pig iron, rolled iron and steel (such as billets, bars, plates, shapes, sheets, tin plates, etc.), smooth and barb wire, nails, tacks, pipes and fittings and cast radiators and house-heating boilers. The non-tonnage exports include machinery of a wide variety, but not agricultural implements, hardware, cutlery, etc. The segregation is logical enough in a general way, though not entirely so, since we find the weight of cast radiators and house-heating boilers returned, but car wheels stated only by number, whereby the first is made a tonnage item and the second a non-tonnage item. The Treasury Department has been requested to endeavor to return also the weight of machinery, etc., in addition to the va.ue, but although the subject has been considered several times, it has been concluded that it is not practicable to report the weights.

The tonnage exports are, as is well understood, made chiefly by the United States Steel Corporation, and the most important single items are pig iron, billets, sheet bars, etc., rails, merchant bars, sheets and plates, wire products and pipes and fittings. Exports of each of these items have been averaging more than 10,000 tons monthly.

The exports of the non-tonnage lines, on the other hand, are made by a very large number of producers, including as they do a wide variety. The following single items each show $3,000,000 in value in the past fiscal year: Builders' hardware, builders' tools, firearms, cash registers, electrical machinery, metal working machinery, mining machinery, printing presses, pumping machinery, sewing machines, gasoline traction engines, steam locomotives, other steam engines and typewriters.

To those who have followed with more or less attention the growth in our tonnage iron and steel exports, which reached the million-ton mark in 1900, crossed the one-and-a-half-million-ton mark in 1910 and reached a rate of 3,700,000 gross tons in May last, an exposition of the growth in the non-tonnage exports should prove of interest, for the usual statements as to our export movement involve two general items, the weight of the tonnage exports and the total value of all iron and steel exports, tonnage and non-tonnage, the latter including the value of the former, but a great deal more. We have segregated the values of the tonnage items for a number of years, and in the table below show the familiar tonnage exports, in addition to which are given the declared value of these exports, the value of the non-tonnage exports and the total value of all iron and steel exports, being the sum of these two. To these items is addded a statement of the percentage which the value of the tonnage items constituted of the total value.

Iron and Steel Exports.

Years.	Tonnage. Gross tons.	Tonnage. Value.	Non-tonnage. Value.	Total. Value.	Proportion of tonage value. Per cent.
1904..	1,167,710	$42,551,109	$86,002,504	$128,553 613	33.1
1905..	1,010,255	42,104,348	100 824,165	142,928,513	29.4
1906..	1,325,740	52,215,089	120,340,499	172,555,588	30.3
1907..	1,301,979	60,046,221	137,020,560	197,066,781	30.4
1908..	964,242	43,397,323	107,715,791	151,113,114	28.8
1909..	1.239,709	50,783,138	106,897,193	157,680,331	32.2
1910..	1,537,952	63,276,714	137,995,189	201,271,903	31.4
1911..	2,187,725	86,598,670	163,057,741	249,656,411	34.6

It will be observed that the years 1904 to 1909 inclusive hold closely together as to the character of our exports. The tonnage averaged a trifle over a million tons a year, and the value of this tonnage was about 30

per cent. of the total value of our iron and steel exports, hardware, cutlery, machinery, etc., comprising the remaining 70 per cent. The total values of both fluctuated fairly well in harmony, 1907 showing the highest values. Then came 1910, with a material increase in tonnage, and a corresponding increase in the value of the tonnage exports, while the value of non-tonnage exports increased just a trifle more than the value of the tonnage exports. In 1911 the tonnage exports cut loose from the proportion, showing almost 35 per cent. of the total value, against an average of but little more than 30 per cent. in preceding years. This was due entirely to the increase in tonnage, for the average value per ton decreased from $41.20 to $39.60.

The interesting query will naturally be as to how our tonnage exports compared in value last May, when the quantity was at the rate of 3,700,000 gross tons per annum, or 69 per cent. in excess of the average rate in 1911. The answer is that the proportionate value of tonnage exports increased, but not correspondingly. In May the tonnage exports comprised 40.9 per cent. of the total value, against 34.6 per cent. in 1911. This, while a large gain, was not a gain in proportion to the increase in tonnage. In the first place the average value per ton decreased somewhat from $39.60 in 1911 to $37.21 in May of this year. In the second place the value of the non-tonnage exports had a material increase. The increase in the tonnage, from the average of 1911 to May of this year, was 69 per cent.; the increase in the value of this tonnage was 59 per cent., while the increase in the value of the non-tonnage exports was 22 per cent. This made an increase in the total iron and steel value of 35 per cent.

Making a similar comparison of last May with the year 1910, we find an increase in the value of the tonnage items of 117 per cent., an increase in the value of the non-tonnage items of 44 per cent., and an increase in the total value of 68 per cent. The showing for May is as follows:

Gross tons exported	307,654
Value of tonnage	$11,449,030
Value per ton	$37.21
Value of non-tonnage	$16,601,217
Total value	$28,050,247
Per cent of tonnage value	40.9

It should be mentioned that agricultural implements are not returned by the Treasury Department under iron and steel, although they are made very largely from iron and steel products. These agricultural implement exports amounted in 1911 to $36,241,683, and in last May to $3,338,974, or at the rate of $40,000,000 a year.

The exportation of unfinished steel, rails, plates and shapes, merchant bars, wire products, pipes and fittings, etc., has reached the basis of constituting an independent movement, a trade which supports itself. Unlike the movement of more than a decade ago, which was largely of the "dumping" character, it does not require for its maintenance the support of a higher price level in the domestic market, making the export trade profitable only by its pulling down the cost of production upon the entire output. The export trade is profitable, regarded as a proposition by itself, and, indeed, lately in many cases higher delivered prices have been secured upon export than upon domestic business.

This change in the price alignment between domestic and export business in iron and steel products effects two results: 1. It permits of a large increase in the tonnage exports. 2. By the close approach of domestic and foreign prices, it places our manufacturers of machinery and other iron and steel manufacturers in better position relative to their foreign competitors, and thus the exports of manufactures of iron and steel have grown apace. The $16,601,217 of iron and steel manufactures exported last May, this being apart from the value of the tonnage lines, represented a rate of $200,000,000 annually, which is double the rate of so recent a year as 1905, and is triple the rate of 1898.

To Make the Premium System Illegal

A remarkable bill was reported to the United States Senate last week by Chairman Borah of the Committee on Education and Labor, its design being "to regulate the method of directing the work of Government employees." Doubtless its drafting resulted from the report of the special committee of the House of Representatives, which dealt with the Taylor and other systems of management in Government shops. That report was by no means friendly to the premium system or to the bonus system, and it took special exceptions to the time study of detailed operations, the committee finding that the workman "considers such a procedure [timing with a stop-watch] an indignity which recognizes him as being in the same class as a beast of burden or a machine." Such timing, by the bill just reported to the Senate, is made a misdemeanor. The text follows:

> Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That it shall be unlawful for any officer, manager, superintendent, foreman, or other person having charge of the work of any employee of the United States Government to make or cause to be made with a stop-watch or other time-measuring device a time study of the movements between the starting and completion of any job of any such employee. No premium or bonus or cash reward shall be paid to any employee, except for suggestions resulting in improvement or economy in the operation of the plant in which he is employed.
>
> SEC. 2. That any violations of the provisions of this Act shall be deemed a misdemeanor and shall be punished by a fine of not more than $500 or by imprisonment of not more than six months, at the discretion of the court.

To use a stop-watch to time component operations, with the time-observer not in proximity to the workman, would be as unlawful as if the watch-holder stood beside the operative; yet the ostensible reason for this part of the bill is that the workman should be protected against something he considers an indignity. The bill would even make it unlawful for a foreman to determine the time a workman consumed in performing a particular piece of work, even though it were ascertained by a casual look at the shop clock when the order slip was put in hand and another glance at the clock when the order was completed.

The most obvious thing about this ridiculous bill is that it is an expression of the trade union antipathy to premium and bonus systems. It is perfectly plain that the eight-hour day on Government contracts was chiefly designed as the entering wedge to an eight-hour basis for industry generally. In like manner the main purpose of the bill just reported is to put the brand of Congressional disapproval on any system of shop man-

agement that seeks to give rewards to the fit, the skilled and the swift, and to provide the most scientific and feasible method of differentiating between high and low degrees of efficiency. To such uses have Congressmen come in this day of the high efficiency of labor in politics.

The Stanley Committee's Proposed Bills

Drastic Amendments to Sherman Act Recommended

Radical changes in the Sherman anti-trust act are proposed in the legislative recommendations of the majority of the Stanley Committee which has been investigating the United States Steel Corporation. These recommendations, it is alleged, will constitute the most severe blow at corporate interests of great magnitude that has ever been devised under the American constitution. Many politicians go so far as to say that their radical essence will prevent a Congressional adoption of the propositions.

Nature of the Several Recommendations

One recommendation—that the burden of proof in regard to reasonableness or unreasonableness of guilt must rest on the defendant corporation when a suit for restraint of trade is brought—is somewhat unique in legal procedure. Another recommendation, more remarkable because of its revolutionary nature than for its comparative importance, is that individuals shall have power to bring suits in equity for injunctions under the Sherman anti-trust act, and that they shall have further power to intervene in any Government-instituted suit brought under this act.

That the control of 30 per cent. of the production of any product by a corporation shall constitute evidence of unreasonable restraint of trade is a striking feature of the legislation proposed by the committee. The committee also propounds a provision which entitles any individual defendant to use the judgment obtained by the Government against any corporation as a conclusive finding against the corporation in a suit to recover damages.

Another interesting proposition is that which empowers the court to issue an order compelling combinations which monopolize any product of interstate commerce to grant the use of such product to a complainant until a satisfactory substitute is found.

One amendment invests the court with the sweeping power of dissolving corporations, the contention of the committee being that this legislation will result in a real dissolution, in contradistinction to the legal but in a sense apparent dissolutions made by corporations against which judgments have already been obtained.

Another section prohibits under severe penalty the coincidence or partial coincidence of the directorates of railroads and companies producing their equipment. It is also made unlawful for any mining company or manufacturing corporation to own a railroad.

The Text of the Most Radical Recommendations

Some of the sections containing the most radical recommendations are as follows:

Section 10—Any person who shall be injured in his business or property or shall be threatened with such injury by any other person or corporation by reason of anything forbidden or declared to be unlawful by this act may bring suit in equity in any Circuit Court of the United States in the district in which the defendant resides or is found to prevent and restrain violations of this act and for other appropriate relief.

Section 11—Whenever suit has been instituted under section 4 of this act any person who shall be injured in his business or property or threatened with such injury by the defendants in said suit or any of them by reason of anything forbidden or declared to be unlawful in this act, and any State of the United States may at any time intervene in said suit to protect his interests, or if the intervener be a State the interests of the citizens of such State and any persons interested, or any State may after final decree in said suit petition said court for protection or redress in case of any violation of said decree, and the court shall have power to take such action as may be appropriate in the premises.

Section 12—Whenever in any suit it shall appear that any combination was entered into, existed or exists which was or is in restraint of trade, the burden of proof to establish the reasonableness of such restraint shall be upon the party who contends that such restraint is reasonable.

Section 13—Whenever in any suit it shall appear that any combination was entered into, existed or exists, which was or is in restraint of trade, such restraint shall be conclusively deemed to have been and to be unreasonable and in violation of the provisions of this act as to any party thereto who is carrying on any business to which such combination relates or in connection therewith.

What the Majority Report Says

The committee states that its recommendations under section 3 are carefully aimed at various practices pursued by certain big corporations. "It seems best," the majority report runs, "to adopt this form of securing prohibition in order to leave intact the present Sherman law as interpreted by the Supreme Court in the Standard Oil and Tobacco cases. Practically every one of the practices specifically enumerated as being conclusively unreasonable has been viewed in one or more of the trust cases as strong evidence of illegality and has been subjected to general public condemnation."

In regard to its acts defining unreasonable restraint of trade the committee says: "This enumeration will serve the purpose of removing to a large extent that uncertainty in the Sherman law which was so widely complained of by business men after the decision of the Supreme Court in the Standard Oil cases declared that only combinations unreasonably in restraint of trade were prohibited. By the specifications above referred to the act makes clear what would otherwise be involved in doubt, and if this provision is enacted few will have difficulty in determining what the law prohibits them from doing."

Among specific references to the Steel Corporation in the majority report is the following: "The enormous earnings of the Steel Corporation are due not to a degree of integration of efficiency not possessed by its competitors, but to the ownership of ore reserves out of all proportion to its output or requirements and to the control and operation of common carriers, divisions of rates, and the liberal alliances obtained from other concerns through inequitable and inordinate terminal allowances. The business of production and transportation should be absolutely separate and distinct, and no industrial concern should be permitted to own or operate an interstate carrier."

Instruction for Motor Truck Drivers

To provide proper handling and care of commercial motor vehicles and in recognition of a lack of opportunity for training men who are to become drivers, the Knox Automobile Company, Springfield, Mass., has adopted what is substantially a course of instruction which, it is reported, has been productive of satisfactory results from the standpoint of the company and its patrons. The length of the course given depends on the amount of time allowed to the men by the employing company or city (the latter in the case of the purchaser of motor-driven fire apparatus), but the company suggests that the most satisfactory arrangement is for the men to follow the assembly of the cars in the factory, beginning with the motor and ending with driving instruction during the rough test of the chassis.

It is stated that the course enables the men to become familiar with the various parts of the cars in detail, as well as teaching them practically all the essental adjustments, so that they feel a measure of confidence and can give intelligent thought to the care and maintenance of the expensive machinery. The company holds that no business concern or city can afford to spend $3,000 to $10,000 for a modern motor truck and put it in the hands of a poorly trained driver to abuse and ruin in a short time. While it is admitted that the method of instruction is an item of considerable expense and often a source of hindrance to regular employees, it is of benefit to the purchaser and brings a gratifying degree of confidence between the Knox company and the prospective purchaser, as well as helping to put the whole motor truck industry on a firm foundation.

The slagging type of gas producer is the subject of a 14-page pamphlet, technical paper No. 20, issued by the Bureau of Mines, Department of the Interior, Washington, D. C. Tests reported with coke, employing limestone as a flux, indicate promise that high ash fuels may be successfully utilized.

The Iron and Metal Markets

Steel Mills Oversold

Premiums Paid for Prompt Shipment

Advances on Wire, Skelp and Light Rails

New business in most finished steel products is considerably under the rate of shipment from the mills. Steel manufacturers, however, are perhaps less interested in the actual rate at which orders are coming in for future delivery than in the very serious problem of meeting satisfactorily the demand for better deliveries on contracts previously booked.

It now seems to be well established that important steel interests oversold their capacity in the early months of this year and are reaping the consequences. This is a customary feature of the increase in demand following a long period of enforced economy among consumers. Some of the prompt delivery business now coming to plate mills in eastern Pennsylvania represents cancellations of orders previously placed with other producers, while Chicago advices state that if shipments could be insured a large tonnage of new business would be placed on order books in that district. New projects in the West requiring steel are being delayed as a result of the mill situation. Premiums for plates, structural shapes and steel bars are being obtained for prompt delivery in the Chicago market, steel bars commanding as high as $3 per ton above the regular price. Cleveland advices state that premiums of $5 per ton on steel bars and $4 to $5 on plates are being obtained there for quick shipment.

Most makers of finished products report their order books well filled for the current quarter, while some are feeling quite gratified with the amount of business they have been able to book running into the last quarter. Added business is sure to come in the early future from interests depending upon railroad buying. Car and locomotive orders are more numerous, orders for about 10,000 cars and about 300 locomotives having been placed the past week, while estimates are being made of much larger requirements in these lines which are confidently expected to take market form at an early date. An interesting development in this connection is the manner in which railroad companies are purchasing machinery equipment for their repair shops. The promise of larger traffic over the railroads this fall is thus making itself felt in various directions.

Rail contracts are few but would perhaps be more numerous if the rail makers were able to promise early delivery. Orders for 13,000 tons of rails were placed last week with Chicago mills for October delivery and other negotiations are pending. The Southern New England, the new extension of the Grand Trunk, is inquiring for 10,000 tons for delivery this year.

Prices are firm, as may be inferred from the above reports of premiums, and some additional advances are to be noted this week. The wire manufacturers have advanced their prices $1 per ton, making the new rate on plain wire $1.45 per 100 lb. Pittsburgh, and wire nails $1.65 per keg. This advance was made notwithstanding some irregularity prevailing in the price of wire products at the old level. The generally quiet condition of the wire trade blunts the effect of this advance but it will probably place producers in better position for the opening of fall trade. The makers of steel skelp have advanced their price $1 per ton. Light rails have been advanced 9c. per 100 lb. on 12 lb. up and 4½c. on 8 and 10 lb. It would not be surprising if another advance of $1 per ton should be made within the next two weeks on steel bars.

The pig iron situation is strong. The Western demand is much more pronounced, and the recent advance on local iron at Chicago is thoroughly established. No. 2 foundry has been marked up 25c. per ton in the Mahoning and Shenango valleys and an early advance is expected in Bessemer. The producers of foundry pig iron in the East are also endeavoring to get an advance of 25c.

The coke situation appears to have grown more favorable for consumers. A split has occurred in the ranks of the Connellsville operators who were holding their furnace coke at $2.50, and there are now two parties. Under date of Saturday a brokerage firm at Uniontown sent out a circular letter to consumers soliciting their business on behalf of a number of operators, while a Pittsburgh firm which controls a large tonnage of coke is now acting independently. A difference of opinion arose as to the best method of marketing coke, and now one party is holding prompt coke at $2.50, but would sell on contract at about $2.35, while the other party is offering prompt coke at $2.25, but is indisposed to sell any large tonnage on contract at this figure.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	July 24, 1912.	July 17, 1912.	June 26, 1912.	July 26, 1911.
Pig Iron, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	$15.75	$15.75	$15.50	$15.00
Foundry No. 2, Valley furnace.	**13.50**	13.25	13.25	13.50
Foundry No. 2, Southern, Cincinnati	14.75	14.75	14.25	13.25
Foundry No. 2, Birmingham, Ala.	11.50	11.50	11.00	10.00
Foundry No. 2, at furnace, Chicago*	**15.00**	14.50	14.50	14.50
Basic, delivered, eastern Pa.	15.50	15.50	15.25	14.50
Basic, Valley furnace	13.50	13.50	13.25	13.00
Bessemer, Pittsburgh	15.15	15.15	15.15	15.90
Malleable Bessemer, Chicago	14.50	14.50	14.50	15.00
Gray forge, Pittsburgh	13.90	13.90	13.90	13.90
Lake Superior charcoal, Chicago	16.25	16.25	16.25	16.50
Billets, etc., Per Gross Ton:				
Bessemer billets, Pittsburgh	21.50	21.50	21.50	21.00
Open hearth billets, Pittsburgh	21.50	21.50	21.50	21.00
Forging billets, Pittsburgh	28.00	28.00	28.00	26.00
Open hearth billets, Philadelphia	24.40	24.40	23.40	23.40
Wire rods, Pittsburgh	25.00	25.00	25.00	27.00
Old Material, Per Gross Ton:				
Iron rails, Chicago	16.00	16.00	16.00	14.00
Iron rails, Philadelphia	16.50	16.50	16.50	17.50
Car wheels, Chicago	*13.50*	14.00	14.00	12.50
Car wheels, Philadelphia	14.00	14.00	14.00	13.00
Heavy steel scrap, Pittsburgh	*13.25*	13.50	13.50	13.25
Heavy steel scrap, Chicago	11.50	11.50	11.75	10.50
Heavy steel scrap, Philadelphia	13.50	13.50	13.50	13.50

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Finished Iron and Steel. Per Pound to Largest Buyers:	July 24, 1912. Cents.	July 17, 1912. Cents.	June 26, 1912. Cents.	July 26, 1911. Cents.
Bessemer rails, heavy, at mill	1.25	1.25	1.25	1.25
Iron bars, Philadelphia	1.32½	1.32½	1.30	1.27½
Iron bars, Pittsburgh	1.35	1.35	1.35	1.25
Iron bars, Chicago	1.35	1.35	1.27½	1.20
Steel bars, Pittsburgh	1.25	1.25	1.20	1.20
Steel bars, tidewater, New York	1.41	1.41	1.36	1.36
Tank plates, Pittsburgh	1.30	1.30	1.25	1.35
Tank plates, tidewater, New York	1.46	1.46	1.41	1.51
Beams, Pittsburgh	1.30	1.30	1.25	1.35
Beams, tidewater, New York	1.46	1.46	1.41	1.51
Angles, Pittsburgh	1.30	1.30	1.25	1.35
Angles, tidewater, New York	1.46	1.46	1.41	1.51
Skelp, grooved steel, Pittsburgh	**1.25**	1.20	1.20	1.25
Skelp, sheared steel, Pittsburgh	**1.30**	1.25	1.25	1.35
Sheets, Nails and Wire, Per Pound to Largest Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.00	2.00	1.90	2.00
Wire nails, Pittsburgh	**1.65**	1.60	1.60	1.70
Cut nails, Pittsburgh	1.55	1.55	1.55	1.60
Fence wire, ann'led, 0 to 9, Pgh.	**1.45**	1.40	1.40	1.50
Barb wire, galvanized, Pittsburgh	**1.95**	1.90	1.90	2.00
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt shipment	*$2.20*	$2.25	$2.10	$1.50
Furnace coke, future delivery	2.25	2.25	2.25	1.65
Foundry coke, prompt shipment	2.40	2.40	2.40	1.85
Foundry coke, future delivery	*2.40*	2.50	2.00	2.00
Metals, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	**17.62½**	17.12½	17.75	12.75
Electrolytic copper, New York	**17.62½**	17.00	17.62½	12.60
Spelter, St. Louis	**7.20**	7.15	6.95	5.60
Spelter, New York	**7.35**	7.30	7.10	5.80
Lead, St. Louis	4.60	4.60	4.37½	4.45
Lead, New York	4.70	4.70	4.50	4.50
Tin, New York	**43.75**	43.62½	48.15	42.00
Antimony, Hallett, New York	7.87½	7.87½	7.75	8.00
Tin plate, 100-lb. box, New York	**$3.74**	$3.64	$3.64	$3.94

Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb., New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.30c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square ft., are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square ft., to take base price. Plates over 72 in. wide ordered less than 11 lb. per square ft., down to the weight of 3-16 in., take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras.	Cents per lb.
Gauges under ¼ in. to and including 3-16 in. on thinnest edge	.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates) 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Wire Rods and Wire.—Bessemer, open hearth and chain rods, $25. Fence wire, Nos. 0 to 9, per 100 lb., terms, 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed, $1.40; galvanized, $1.70. Galvanized barb wire, to jobbers, $1.90; painted, $1.60. Wire nails, to jobbers, $1.60.

The following table gives the price to retail merchants on wire in less than carloads, including the extras Nos. 10 to 16, which are added to the base price:

Fence Wire, per 100 lb.

Nos.	0 to 9	10	11	12 & 12½	13	14	15	16
Annealed	$1.55	$1.60	$1.65	$1.70	$1.80	$1.90	$2.00	$2.10
Galvanized	1.85	1.90	1.95	2.00	2.10	2.20	2.60	2.70

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in., and angles, 3 to 6 in., on one or both legs, ¼ in. and over, 1.30c. Other shapes and sizes are quoted as follows:

	Cents per lb.
I-beams over 15 in.	1.35 to 1.40
H-beams over 18 in.	1.35 to 1.40
Angles over 6 in.	1.35 to 1.40
Angles, 3 in. on one or both legs, less than ¼ in. thick, plus full extras, as per steel bar card Sept. 1, 1909	1.35 to 1.40
Tees, 3 in. and up	1.35 to 1.40
Zees, 3 in. and up	1.30 to 1.35
Angles, channels and tees, under 3 in. plus full extras as per steel bar card Sept. 1, 1909.	1.35 to 1.40
Deck beams and bulb angles	1.60 to 1.65
Hand rail tees	2.10 to 2.25
Checkered, trough and corrugated floor plates	2.25 to 2.50

Extras for Cutting to Length.

	Cents per lb.
Under 3 ft., to 3 ft., inclusive	.25
Under 2 ft., to 1 ft., inclusive	.50
Under 1 ft.	1.55

No charge for cutting to lengths 3 ft. and over.

Sheets.—Makers' prices for mill shipments on sheets of U. S. Standard gauge, in carload and larger lots, on which jobbers charge the usual advance for small lots from store, are as follows:

Blue Annealed Sheets.

	Cents per lb.
Nos. 3 to 8	1.40
Nos. 9 and 10	1.45
Nos. 11 and 12	1.50
Nos. 13 and 14	1.55
Nos. 15 and 16	1.65

Box Annealed Sheets, Cold Rolled.

Nos. 10 to 12	1.65 to 1.70
Nos. 13 and 14	1.70 to 1.75
Nos. 15 and 16	1.75 to 1.80
Nos. 17 to 21	1.80 to 1.85
Nos. 22, 23 and 24	1.85 to 1.90
Nos. 25 and 26	1.90 to 1.95
No. 27	1.95 to 2.00
No. 28	2.00 to 2.05
No. 29	2.05 to 2.10
No. 30	2.15 to 2.20

Galvanized Sheets of Black Sheet Gauge.

Nos. 10 and 11	2.10 to 2.15
Nos. 12, 13 and 14	2.20 to 2.25
Nos. 15 and 16	2.25 to 2.30
Nos. 17 to 21	2.50 to 2.55
Nos. 22, 23 and 24	2.60 to 2.65
Nos. 25 and 26	2.80 to 2.85
No. 27	2.95 to 3.00
No. 28	3.10 to 3.15
No. 29	3.20 to 3.25
No. 30	3.40 to 3.45

All above rates on sheets are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount in 10 days from date of invoice, as also are the following:

Corrugated Roofing Sheets by Weight.

Effective April 18, 1912, the rates for painted and formed roofing sheets, per 100 lb., as announced by most of the leading sheet manufacturers, are based on the following extras for painting and forming over prices for corresponding gauges in black and galvanized sheets:

	Gauges, cents per 100 lb.			
Painting.	29	25 to 28	19 to 24	12 to 18
Regular or oiling	...	0.15	0.10	0.05
Graphite, regular	...	0.25	0.15	0.10
Forming.				
2, 2½, 3 and 5 in. corrugated	0.05	0.05	0.05	0.05
2 V-crimped, without sticks	0.05	0.05	0.05	...
⅝ to 1¼ in. corrugated	0.10	0.10	0.10	...
3 V-crimped, without sticks	0.10	0.10	0.10	...
Pressed standard seam, with cleats	...	0.15	0.15	...
Plain roll roofing, with or without cleats	0.15	0.15	0.15	...
Plain brick siding	...	0.20	...	...
3-15 in. crimped	0.20	0.20	0.20	...
Weatherboard siding	...	0.25	0.25	...
Beaded ceiling	...	0.25	0.25	...
Rock, face brick and stone siding	...	0.25	0.25	...
Roll and cap roofing, with caps and cleats	0.25	0.25	...	...
Roofing valley, 12 in. and wider	...	0.25	0.25	...
Ridge roll and flashing (plain or corrugated)	...	0.65	0.65	0.65

Wrought Pipe—The following are the jobbers' carload discounts (card weight) on the Pittsburgh basing card on steel pipe, in effect from June 1, 1912, on 6 in.

and smaller, and from July 1, 1912, on sizes above 6 in.; black iron pipe from June 15, 1912; galvanized iron pipe from June 15, 1912, one point greater being allowed on merchant weight:

Butt Weld.

	Steel		Iron	
	Black.	Galv.	Black.	Galv.
⅛ and ¼ in.	73	53	..	..
⅜ in.	74	64	68	52
½ in.	77	67	71	58
¾ to 1½ in.	80	72	74	63
2 to 3 in.	81	74	75	64

Lap Weld.

1½ in.	..	..	69	58
2 in.	78	71	71	62
2½ to 4 in.	80	73	73	65
4½ to 6 in.	79	71	72	64
7 to 12 in.	77	67	70	60
13 to 15 in.	54	..	46	..

Plugged and Reamed.

1 to 1½ in., butt weld	78	70	72	61
2 to 3 in., butt weld	79	72	73	62
2 in., lap weld	76	69	69	60
2½ to 4 in., lap weld	78	71	71	63

Butt Weld, extra strong, plain ends, card weight.

⅛, ¼, ⅜ in.	69	59	64	54
½ in.	74	68	69	62
¾ to 1½ in.	78	72	73	64
2 to 3 in.	79	73	74	65

Lap Weld, extra strong, plain ends, card weight.

1½ in.	..	..	63	55
2 in.	75	69	70	62
2½ to 4 in.	77	71	72	65
4½ to 6 in.	76	70	71	64
7 to 8 in.	69	59	64	54
9 to 12 in.	64	54	59	49

Butt Weld, double extra strong, plain ends, card weight.

¼ in.	64	58	59	51
¾ to 1½ in.	67	61	62	54
2 to 2½ in.	69	63	64	56

Lap Weld, double extra strong, plain ends, card weight.

2 in.	65	59	60	51
2½ to 4 in.	67	61	62	56
4½ to 6 in.	66	60	61	55
7 to 8 in.	59	49	54	44

The above discounts are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized.

Boiler Tubes.—Discounts on lap welded steel and standard charcoal iron boiler tubes to jobbers in carloads are as follows:

Steel.		*Standard Charcoal Iron.*	
1¾ to 2¼ in.	64	1½ in.	48
2½ in.	66½	1¾ to 2¼ in.	50
2¾ to 3¼ in.	71½	2½ in.	55
3½ to 4 in.	74	2¾ to 3¼ in.	57½
5 to 6 in.	66½	3½ to 5 in.	60
7 to 13 in.	64	Locomotive and steamship special grades bring higher prices.	

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.
Less than carloads will be sold at the delivered discounts for carloads, lowered by two points for lengths 22 ft. and under to destinations east of the Mississippi River; lengths over 22 ft. and all shipments going west of the Mississippi River must be sold f.o.b. mill at Pittsburgh basing discount, lowered by two points.

Pittsburgh

PITTSBURGH, PA., July 24, 1912.

The feature of the market is the heavy specifying in steel products at a time when quiet conditions were expected. Some important mills report that their specifications thus far this month are in excess of those for the same period in June, while others report only a negligible falling off. Specifications are heavy on practicaliy all of the finished steel products, and mills are falling behind in deliveries, particularly because of the fact that shipments are curtailed on account of the heat and by reason of mills closing for repairs. Deliveries of bars are farthest behind, it being impossible with most mills to secure deliveries on new specifications in less than six weeks. Some of the pipe mills are refusing to make contracts, and are accepting orders only when specifications are attached. In line pipe the tendency is not to hold quotations open for more than 24 hr. Under date of July 20 the American Steel & Wire Company advanced its prices $1 per ton, putting nails on the basis of $1.65. This is the third advance since the low price of $1.50 was reached last November, the other advances having been on December 11, 1911, and January 23.

Pig Iron.—The local market has been very quiet, but prices are extremely well held and advances are expected as soon as any active inquiry starts. The furnaces now in operation have their product well sold up for this quarter and much of it for the fourth quarter. The pig iron makers have been in no hurry to advance prices as this would encourage idle furnaces to blow in. Bessemer iron is expected to advance before long, as the large steel works are running full and may need to buy a little outside iron, which would undoubtedly have an immediate effect in stiffening prices. We note sales of 100 to 300 tons of Bessemer at $14.25 and $14.40, valley, but it is a question whether a large lot could be secured at the lower price. Malleable iron has moved up in sympathy with basic. We quote as follows: Bessemer, $14.25 to $14.50; basic, malleable Bessemer and No. 2 foundry, $13.50; gray forge, $13, all at Valley furnaces, the freight rate to the Pittsburgh district being 90c. a ton.

Steel Billets and Sheet Bars.—Mills have been specifying billets and sheet bars upon contracts at earlier dates than the contracts required, and are frequently in the market for additional lots, which are hard to get, as it is impossible to find room for more than small lots, and only occasionaily. We quote for delivery in third quarter as follows: Bessemer and open-hearth billets, $21.50 to $22; Bessemer and open-hearth sheet bars, $22 to $22.50; axle billets, $25 to $26; forging billets, to be used for general forging purposes, $28, all f.o.b. cars, Pittsburgh or Youngstown mill.

Ferroalloys.—Consumers are beginning to figure on ferromanganese for the first half of next year, practically all the business for the current half having been done. Prompt ferromanganese can be had at the same price as contract, and we quote all deliveries at $48.50, Baltimore, freight to Pittsburgh being $1.95. We quote 50 per cent. ferrosilicon in lots up to 100 tons at $72.50; over 100 tons to 600 tons, $71.50, and over 600 tons, $70.50, Pittsburgh. The lower grades are ruling at about $20 for 10 per cent., $21 for 11 per cent. and $22 for 12 per cent., f.o.b. cars at Ashland, Ky., or Jackson, Ohio. On ferrotitanium we quote 8c. per lb. for carload lots, 10c. per lb. in 2000-lb. lots and over, and 12½c. per lb. in lots up to 2000 lb.

Wire Rods.—Inquiry has somewhat increased since the advance in wire products, which is expected to have a sentimental effect upon the rod market. We quote Bessemer, open-hearth and chain rods at $25, Pittsburgh.

Muck Bar.—The supply of muck bar in the open market is very limited, most of the mills being out of the market. We quote best grades of all-pig muck bar at $30 to $30.50, Pittsburgh.

Skelp.—Steel skelp has stiffened $1 a ton, in sympathy with the recent advances in plates and pipe, and early deliveries are hard to secure. We quote grooved steel skelp at 1.25c.; sheared steel skelp at 1.30c.; grooved iron skelp, 1.65c. to 1.70c., and sheared iron skelp, 1.70c. to 1.75c., delivered buyer's mill in the Pittsburgh district.

Steel Rails.—An advance of 9c. per 100 lb. has been made in light rails, 12 to 45-lb. inclusive, and 4½c. in 8 and 10-lb. sections. Demand has been excellent and the mills find no difficulty in operating full. Specifications on contracts for standard rails are also good, and the export demand continues very satisfactory. We quote splice bars at 1.50c. per lb. and rails as follows: Standard sections, 1.25c. per lb.; 8 and 10-lb., 1.34c.; 12 and 14-lb., 1.29c.; 16 and 20-lb., 1.24c.; 25, 30, 35, 40 and 45-lb., 1.19c., in carload lots, f.o.b. Pittsburgh.

Structural Material.—Inquiry for fabricated steel continues good and a considerable tonnage is likely to be placed before the end of the active season. The American Bridge Company has secured the contract for the Adams Express building, New York, involving 14,600 tons, and a contract for a hotel in Chicago involving 11,000 tons. Fabricating prices are said now to be on the basis of 1.30c. for the plain material, plus the fabricating charges. We quote beams and channels up to 15 in. at 1.30c., Pittsburgh, on new orders.

Plates.—There is active inquiry in the market which might involve 15,000 to 20,000 cars, though it is questionable whether this will all develop into business, on account of the difficulty in securing desired deliveries. The New York Central is inquiring for 5000 cars and the Buffalo, Rochester & Pittsburgh for 1500 cars. It is believed that railroads are trying to arrange the financing of a much larger number of cars than are now in the market, and that inquiries will come out later. Premiums are frequently paid for universal mill plates for early delivery, as the mills are many weeks behind in deliveries. We quote ¼ in. and heavier plates at 1.30c., Pittsburgh.

Steel Bars.—Buyers state that they cannot as a rule secure deliveries on new specifications in less than about six weeks. The mills have been falling farther behind. Specifications have been practically as good this month as last. In the past week several buyers have shown a desire to be covered on bars for the fourth quarter, apparently anticipating another advance, and in some quarters it is regarded as not unlikely that bars will advance another dollar a ton within say a fortnight. We quote steel bars at 1.25c. and iron bars at 1.35c., f.o.b. Pittsburgh.

Hoops and Bands.—Consumers are well covered and new demand is relatively light, but specifications are coming in very freely. We quote bands at 1.25c., with extras as per the steel bar card, and hoops at 1.40c., f.o.b. Pittsburgh.

Sheets.—Several of the independent sheet mills have advanced their prices to the new basis of the American Sheet & Tin Plate Company made effective July 16, or 2.05c. for black and 3.15c. for galvanized, No. 28 gauge. Other mills have advanced their prices slightly, by withdrawing the lowest quotations, and the market is quotable at 2c. to 2.05c. for black sheets, No. 28 gauge, and 3.05c. to 3.15c. for galvanized, No. 28 gauge. Specifications show no decrease, and there is already some buying at the advanced prices. The leading interest is operating about 85 per cent. of its sheet capacity, having a few mills down at several plants for repairs, while the independent mills on the whole are operating about 75 per cent., several plants being closed for short periods for repairs.

Tin Plate.—Most of the mills already have specifications on books sufficient to run them full into September, and specifications are still coming in at a lively rate. Practically all the can makers underestimated their requirements when placing contracts for the season. Relatively little export and rebate business is now being taken, the mills being unable to make the requisite deliveries. Very few of the mills are off for repairs, and more than 90 per cent. of the effective capacity is in operation. The market is firm on the basis of $3.50 for 100-lb. coke plates, Pittsburgh.

Bolts and Rivets.—The predicted advance in rivets has not yet been announced, but may be before the week is over. We repeat former quotations at $1.60 for button head structural rivets and $1.70 for cone head boiler rivets, per 100 lb., base in carload lots, f.o.b. Pittsburgh. An advance of 2½ to 5 per cent. has been made in bolts and nuts, following the advance made several weeks ago, and we now quote: G. P. Coach and lag screws, 80 and 17½ per cent. off; small carriage bolts, cut threads, 80 and 5 per cent. off; small carriage bolts, rolled threads, 80 and 10 per cent. off; large carriage bolts, 75 and 5 per cent. off; small machine bolts, rolled threads, 80 and 15 per cent. off; small machine bolts, cut threads, 80 and 10 per cent. off; large machine bolts, 75 and 10 per cent. off; square hot-pressed nuts, blank and tapped, $6.20 off, and hexagon nuts, $7.00 off. These prices are in lots of 300 lb. or over, delivered within a 20c. freight radius of maker's works.

Shafting.—Producers of shafting are now well filled up, and are receiving fairly large specifications on contracts, so that discounts are being well observed. We quote cold rolled shafting at 65 per cent. off in carload and larger lots and 60 per cent. off in less than carload lots, delivered in base territory.

Spelter.—Speiter continues very strong, with an advancing tendency. The market is quotable at 7.17½c. to 7.22½c., delivered Pittsburgh, equal to 7.05c. to 7.10c., East St. Louis.

Railroad Spikes.—Considerable spike business is being taken at the advanced prices of July 16, as many buyers underestimated their requirements when placing contracts. Producers are all well sold ahead, though they can make some early deliveries of moderate sized lots. We quote railroad spikes, base sizes, 5½ by 9/16 in., at $1.60, and small railroad and boat spikes at $1.65 to $1.70 per 100 lb., f.o.b. Pittsburgh.

Wire Products.—Under date of July 20 the American Steel & Wire Company mailed circulars to the trade announcing an advance of $1 a ton in wire products, independent mills immediately marking up their prices also. Very little new business is being placed at the advanced prices, but specifications have increased and mills have grown reserved as to accepting business on old contracts at prices lower than those recently ruling. The fall business promises to open early, and the wire mills now are operating at a much better rate than at this time last year. We quote wire nails at $1.65; cut nails, $1.55; galvanized barb wire, $1.95; painted, $1.65; annealed fence wire, $1.45, and galvanized fence wire, $1.75, f.o.b. Pittsburgh, usual terms, freight added to point of delivery.

Merchant Steel.—Business is comparatively quiet, but as mills are well booked ahead and anticipated the quietness, the market is in satisfactory condition. We quote: Iron finished tire, 1½ x ⅜ in. and larger, 1.25c., base; under ⅜ in., 1.35c.; planished tire, 1.45c.; channel tire, ¾, ⅞ and 1 in., 1.70c.; 1⅛ in. and larger, 1.60c.; toe calk, 1.75c., base; flat sleigh shoe, 1.25c.; concave or convex, 1.60c.; cutters shoes, tapered or bent, 2.20c.; spring steel, 1.80c.; machinery steel, smooth finish, 1.60c., all f.o.b. cars, Pittsburgh.

Merchant Pipe.—Some of the pipe mills are not making contracts for merchant pipe and are accepting orders only when specifications are attached. On line pipe some of the large mills are making quotations good only for 24 hr. Specifications are quite heavy and the mills have as much business as they can handle considering the labor shortage, which is bearing rather heavily upon production. Regular discounts are said to be firmly held.

Boiler Tubes.—The mills are fairly well filled up for two or three months ahead, and are receiving specifications at a rate about equal to shipments. Discounts are being firmly held.

Iron and Steel Scrap.—The scrap market has grown somewhat softer, owing to the continuance of light demand from consumers. The embargo at the plant of the Pittsburgh Steel Company is expected to come off this week, but the embargo at Max Solomon's yard may be kept on next week. Dealers are disappointed at the lightness of demand considering how fully the mills are employed. There have been no important sales of heavy melting steel, and small lots can now be picked up at $13.25, though dealers would hardly sell at less than $13.50, and then only in limited tonnages. Dealers quote as follows per gross ton:

Heavy steel scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen and Pittsburgh delivery	$13.25 to $13.50
No. 1 foundry cast	13.00 to 13.25
No. 2 foundry cast	11.50 to 11.75
Bundled sheet scrap, f.o.b. consumers' mills, Pittsburgh district	11.50 to 11.75
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	14.50 to 14.75
No. 1 railroad malleable stock	12.50 to 12.75
Grate bars	9.75 to 10.00
Low phosphorus melting stock	15.50 to 15.75
Iron car axles	22.50 to 22.75
Steel car axles	15.75 to 16.00
Locomotive axles	22.00 to 22.50
No. 1 busheling scrap	12.50 to 12.75
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	14.00 to 14.25
*Cast iron borings	9.50 to 9.75
*Machine shop turnings	10.00 to 10.25
†Sheet bar crop ends	14.75 to 15.00
Old iron rails	15.75 to 16.00
No. 1 wrought scrap	13.75 to 14.00
Heavy steel axle turnings	11.00 to 11.25
Stove plate	10.25 to 10.50

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.
†Shipping point.

Coke.—A split has occurred in the ranks of the Connellsville operators who were waiting to sell their furnace coke at $2.50, and there are now two parties. Under date of Saturday a brokerage firm at Uniontown sent out a circular letter to consumers soliciting their business on behalf of a number of operators, while a Pittsburgh firm which controls a large tonnage of coke is now acting independently. A difference of opinion arose as to the best method of marketing coke, and now one party is holding prompt coke at $2.50, but would sell on contract at about $2.35, while the other party is offering prompt coke at $2.25, but is indisposed to sell any large tonnage on contract at this figure. Sales of prompt coke have been made in the past two days at $2.20. There is no inquiry, as the new developments have upset the market temporarily, but the furnaces will soon have to come into the market for August coke, and they are likely to buy only for that month unless the market exhibits more stability than has been apparent of late. We quote: Prompt furnace, $2.20 to $2.25; contract furnace, $2.25 to $2.35; prompt foundry, $2.40 to $2.50; contract foundry, $2.40 to $2.75.

The Chattanooga Roofing & Foundry Company, Chattanooga, Tenn., reports much interest in its Annis Saflok galvanized roofing among large dealers, contractors and lumber dealers. The company is very busy answering inquiries and filling orders. The character of orders received is indicated by the shipment of a full car of Saflok corrugated roofing to a lumber company in Arkansas for a new mill.

Chicago

CHICAGO, ILL., July 23, 1912.

The expected and normal quietness of July seemed to materialize during the first 10 days of the month. While new business continues to be lighter than in June, indications are plain that if shipments could be made a very large tonnage of new business would now be placed on the order books. Many instances exist where new projects requiring steel are being delayed as a result of the mill situation. Premiums are being offered for deliveries of all forms of steel, bar steel bringing as much as $3 above regular quotations. Bar iron prices are $1 a ton higher. Orders for 13,000 tons of rails were placed during the week for October delivery and inquiries for 14,000 tons additional are reported. Contracts for structural material carrying over 17,000 tons were placed, the principal item being the Conway building at Chicago. Estimated inquiries for cars total 80,000 and the demand for locomotives is correspondingly large. Sales of pig iron, both Northern and Southern, were numerous during the week and totaled a large tonnage. The buying was of a general character and was conducted more or less quietly. The price of $15 f.o.b. furnace at Chicago is firmly established and for Southern iron $11.50, Birmingham, for immediate shipment and $12 for fourth quarter delivery are equally firm.

Pig Iron.—The past week was one of considerable activity in the local market though at the end of the week inquiry slackened materially, a number of offers of tonnage being withdrawn because of the advance in price. A large Milwaukee manufacturer bought about 3000 tons for prompt shipment distributing the purchase among local, Southern and Ohio furnaces, the Southern iron bringing $11.50 Birmingham, which basis also applied on a considerable portion of the Northern iron purchased. Local furnaces have sold several thousand tons of iron on the advanced basis at which the quotation is $15, f.o.b. furnace, and apparently there is no iron to be had at less than that figure. One local interest which contemplates the blowing in of an additional furnace shortly has its capacity well filled for the remainder of the year and the market seems likely to grow stronger rather than otherwise. Southern furnaces are equally well sold up, and for fourth quarter $12, Birmingham, is the general quotation. We quote local irons, f.o.b. furnace, the average switching charge to Chicago foundries being nearly 50c. per ton. Other quotations are for Chicago delivery on prompt shipments as follows:

Lake Superior charcoal	$16.25 to $16.75
Northern coke foundry, No. 1	15.50
Northern coke foundry, No. 2	15.00
Northern coke foundry, No. 3	14.50
Northern Scotch, No. 1	16.00 to 16.50
Southern coke, No. 1 foundry and No. 1 soft	16.35 to 16.85
Southern coke, No. 2 foundry and No. 2 soft	15.85 to 16.35
Southern coke, No. 3	15.35 to 15.85
Southern coke, No. 4	14.85 to 15.35
Southern gray forge	14.35 to 14.85
Southern mottled	13.85
Malleable Bessemer	14.50 to 15.00
Standard Bessemer	16.75
Basic	14.50 to 15.00
Jackson County and Kentucky silvery, 6 per cent	17.40
Jackson County and Kentucky silvery, 8 per cent	18.40
Jackson County and Kentucky silvery, 10 per cent	19.40

Rails and Track Supplies.—Orders for 13,000 tons of rails are reported as placed with local mills the past week and another railroad is seeking to place orders for a total of 9000 tons for August delivery, and the Denver, Laramie & Northwestern is inquiring for 5000 tons. In this district October shipment is apparently the best that can be offered. The difficulty the railroads are experiencing in obtaining deliveries is giving rise to suggestions that they will again resort to the former plan of buying ahead. Prices have been advanced on both spikes and bolts, and sales of several thousand kegs at the new prices are noted. We quote standard railroad spikes at 1.70c., base; track bolts with square nuts, 2.10c. to 2.15c., base, all in carload lots, Chicago; standard section Bessemer rails, Chicago, 1.25c., base; open hearth, 1.34c.; light rails, 25 to 45 lb., 1.20c. to 1.25c.; 16 to 20 lb., 1.25c. to 1.30c.; 12 lb., 1.30c. to 1.35c.; 8 lb., 1.35c. to 1.40c.; angle bars, 1.50c., Chicago.

Structural Material.—Contracts have been awarded for the steel for three office buildings in Chicago, totaling nearly 12,000 tons, of which the Conway Building will require 10,258 tons, to be fabricated by the American Bridge Company. The Joliet Bridge & Iron Company will furnish 572 tons for the Linn Building and 818 tons for the Hill Building. Other contracts included 128 tons for the Garden City Spring Works addition, Chicago, 120 tons for the Peden Iron & Steel Company's warehouse, Houston, Tex., 131 tons for the Chicago & Northwestern Railroad, 121 tons for the Mitchell-Lewis Motor Car Company, Racine, Wis., and 190 tons for the Horlicks Malted Milk Company, Racine. The Chicago, Milwaukee & St. Paul Railroad placed 226 tons of miscellaneous material with the Jones & Laughlin Steel Company and 864 tons for bridge work at Spokane with the American Bridge Company. The Brown Hoist Machinery Company, Cleveland, will build a coal handling bridge for the Pittsburgh Coal & Dock Company, Superior, Wis., requiring 875 tons. The Starks Building, Louisville, Ky., 2228 tons, went to Noelke-Richards Iron Works and the Studebaker Corporation's addition at South Bend, Ind., 302 tons, was placed with the Kenwood Bridge Company. The American Bridge Company will also furnish 255 tons of repair material for the Chicago, Rock Island & Pacific Railroad. The general contract for the R. R. Donnelley & Sons Company's building has been awarded to the Leonard Construction Company and calls for reinforced concrete construction instead of 1410 tons of steel as originally figured. Considerably higher prices prevail for fabricated steel and local shops are in a much improved situation as regards volume of work in hand. For plain shapes we quote for mill shipment, Chicago delivery, 1.48c. and from store 1.80c.

Plates.—Reports current regarding car purchases place the number for which inquiry is being made both publicly and quietly in the neighborhood of 80,000. The demand for locomotives also continues and included in the current inquiries are 10 for the Belt Railway at Chicago and 10 for the Minneapolis & St. Louis. The Chicago, Milwaukee & St. Paul has bought 56 from the American Locomotive Company and the Illinois Central 20 from the same company and 50 from the Baldwin Locomotive Works. We quote for mill shipment, Chicago delivery, 1.48c., and from store, 1.80c.

Bars.—The market is quotably stronger for all forms of bars. Where prompt shipment can be made customers are willing to pay any reasonable premium, and sales have been made as high as 1.60c. for soft steel bars, and for a car of hard steel bars for practically immediate shipment the same price was paid. Hard steel quotations are regularly on the basis of 1.35c., Chicago. Bar iron prices are also higher, ordinary business bringing 1.40c. in this market, at which price a number of sales have been made, while 1.35c. is absolute minimum for the most desirable tonnage. We quote as follows: Bar iron, 1.35c. to 1.40c.; hard steel bars, 1.35c.; soft steel bars, 1.43c., and from store, soft steel bars, 1.70c., Chicago.

Sheets.—Western mills have advanced their prices on sheets, both black and galvanized, and in view of the fact that they are not seeking business the new prices are very firm as quoted by them. Some business is being taken, however, at less than the maximum prices. We quote, Chicago delivery, as follows: Carload lots, from mill, No. 28 black sheets, 2.18c. to 2.23c.; No. 28 galvanized, 3.28c. to 3.33c.; No. 10 blue annealed, 1.63c. Prices from store are: No. 10, 1.95c.; No. 12, 2c.; No. 28 black, 2.50c., and No. 28 galvanized, 3.60c.

Rivets and Bolts.—General business continues to be of such volume as to comfortably engage the local capacity. The new plant of the Gary Screw & Bolt Company is in partial operation and is rapidly being brought to a condition of completeness. We quote as follows: Carriage bolts up to ⅜ in. x 6 in., rolled thread, 80 and 15; cut thread, 80 and 7½; larger sizes, 75 and 7½; machine bolts up to ⅜ in. x 4 in., rolled thread, 80 and 20; cut thread, 80 and 12½, larger sizes, 75 and 12½; coach screws, 80 and 20; hot pressed nuts, square head, $6.30 off per cwt.; hexagon, $7.10 off per cwt. Structural rivets, ½ in. and larger, 1.78c. base, Chicago, in carload lots; boiler rivets, 0.10c. additional.

Cast Iron Pipe.—A letting of 600 tons at Pueblo, Col., was awarded to the United States Cast Iron Pipe & Foundry Company, as was an order for 2500 tons from Texas. This company was also low bidder on 1300 tons of pipe at Winnipeg. At Portsmouth, Ohio, all bids were rejected, 2200 tons of pipe being involved. We quote as follows, per net ton, Chicago: Water pipe, 4 in., $27.50; 6 to 12 in., $26; 16 in. and up, $25, with $1 extra for gas pipe.

Wire Products.—Although some irregularity still seems to exist in the price of wire products at the old level, the leading interest has advanced its quotations $1 a ton effective July 22. The general quiet minimizes the effect of this advance but places producers in a better position for the opening of fall trade. We quote as follows: Plain wire, No. 9 and coarser, base,

$1.58; wire nails, $1.78; painted barb wire, $1.78 to $1.83; galvanized, $2.08; polished staples, $1.83; galvanized, $2.13, all Chicago.

Old Material.—The passage of the week has brought little change in the situation. There is some trading among dealers, with a limited buying on the part of the melters, but the general market is quiet with little show of strength. In some grades the available supply for sale is detracting from the firmness with which quotations are made. The Chicago, Burlington & Quincy Railroad is offering 3000 tons of scrap, the Northern Pacific 500 tons and the Chicago & Alton a few carloads. We quote for delivery at buyer's works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton.	
Old iron rails	$16.00 to $16.50
Old steel rails, rerolling	13.25 to 13.75
Old steel rails, less than 3 ft	12.50 to 13.00
Relaying rails, standard section, subject to inspection	24.00
Old car wheels	13.50 to 14.00
Heavy melting steel scrap	11.50 to 12.00
Frogs, switches and guards, cut apart	11.50 to 12.00
Shoveling steel	11.50 to 12.00
Steel axle turnings	9.50 to 10.00

Per Net Ton.	
Iron angles and splice bars	$13.75 to $14.25
Iron arch bars and transoms	15.25 to 15.75
Steel angle bars	11.25 to 11.75
Iron car axles	19.25 to 19.75
Steel car axles	15.50 to 16.00
No. 1 railroad wrought	11.75 to 12.25
No. 2 railroad wrought	10.75 to 11.25
Cut forge	10.75 to 11.25
Steel knuckles and couplers	11.25 to 11.50
Steel springs	11.75 to 12.25
Locomotive tires, smooth	12.25 to 12.75
Machine shop turnings	7.00 to 7.25
Cast and mixed borings	6.25 to 6.50
No. 1 busheling	10.00 to 10.25
No. 2 busheling	7.25 to 7.50
No. 1 boilers, cut to sheets and rings	8.50 to 9.00
Boiler punchings	13.00 to 13.50
No. 1 cast scrap	11.50 to 12.00
Stove plate and light cast scrap	10.00 to 10.25
Railroad malleable	11.75 to 12.00
Agricultural malleable	10.50 to 11.00
Pipes and flues	9.00 to 9.25

Philadelphia

PHILADELPHIA, PA., July 23, 1912.

While the demand continues strong in some directions, particularly for heavy steel plates, new business in other lines is just about holding its own, representing on the average a somewhat smaller volume than was closed during the same period in June. A portion of the business placed with Eastern plate mills for early shipment cannot be construed as strictly new business, orders having been previously placed with other mills and countermanded owing to consumers' inability to get satisfactory delivery. Prompt deliveries are gradually becoming less freely available. Premiums are, in instances, being paid for both plates and shapes for prompt delivery. Billets are fairly active and prices strong. Iron bars are in moderate demand and slightly higher prices established. Little tonnage in finished or semi-finished steel products for export has been reported entered during the week. The movement in pig iron has been confined to small lots, but the aggregate represents a fair amount. Quotations are firm and a number of producers are practically sold up for the third quarter. Coke is weaker, offerings of second half Connellsville furnace coke having been made at $2.30 at oven. Old material has been a trifle more active, with prices practically unchanged.

Iron Ore.—The market in both foreign and domestic ores remains comparatively quiet. Little inquiry from consumers is reported. Importations during the week were confined to Cuban ore, of which 9700 tons were received.

Pig Iron.—The market continues strong. Sellers maintain prices firmly and in a number of instances are pretty well sold up on desirable grades for third quarter shipment, but few sales of foundry grades above several hundred ton lots are reported. Standard brands of eastern Pennsylvania No. 2 X foundry are firm at $15.75 minimum, delivered here, although a moderate volume has been taken at $16, and in a few instances $16.25 has been done. In some instances No. 2 plain is held at practically the same price as No. 2 X, although a differential of 25c. a ton usually applies. The cast iron pipe makers in this district have not been very active inquirers for low grade iron. Several Delaware River consumers have taken on odd lots of low grade iron at pretty full prices, the better grades commanding $15 to $15.25, delivered. A block of 2000 tons of foundry forge, for which the local locomotive builder has recently been inquiring, is reported closed. Virginia foundry iron has not been moving very freely. Producers have, as a rule, little standard analysis iron for early shipment to offer, although small quantities are available for August-September delivery at $13.25, furnace. Fourth quarter No. 2 X is moving slowly at $13.50, furnace, but several producers are not very free sellers at that figure. The leading producer quotes $13.25, furnace, for third quarter high sulphur and high manganese iron. Virginia cast iron pipe makers have taken on further moderate lots of low grade iron. The demand for forge iron for rolling mill purposes has been very light, no movement being reported. Prices are quoted nominally at $15 to $15.25, delivered here. Further quiet inquiries for malleable iron are out, but no sales are reported. Very little movement in steel making grades is noted. An inquiry for 5000 tons of fourth quarter basic, from a Schuylkill Valley consumer, is before the trade. The same buyer closed last week for 500 tons of off basic for early delivery. Producers are pretty well sold up at their present productive rate and are holding pretty firmly at $15.75, delivered. Sales of standard low phosphorus iron have been confined to small lots at both $20 and $20.25, delivered in this vicinity. Urgency for delivery is noted by producers for practically all grades, stocks are reported to be decreasing and, while buying is not large, the strength of the market is fully maintained, the following range of prices being quoted for near future delivery in buyers' yards in this district:

Eastern Pennsylvania No. 2 X foundry	$15.75 to $16.00
Eastern Pennsylvania No. 2 plain	15.50 to 15.75
Virginia No. 2 X foundry	16.05 to 16.25
Virginia No. 2 plain	15.80 to 16.00
Gray forge	15.00 to 15.25
Basic	15.50 to 15.75
Standard low phosphorus	20.00 to 20.25

Ferroalloys.—An expected advance in the price of ferromanganese has brought out considerable inquiry, and a number of small lot sales at $48.50 and in exceptional instances $50, seaboard, have been made. Foreign makers have, in instances, refused offers for round lots at $48.50, Baltimore. There has been little demand for ferrosilicon, prices of which are unchanged at $72.50 for small lots of 50 per cent. Furnace ferrosilicon, 11 per cent., is nominally quoted at $24.80, delivered here.

Billets.—A very fair demand for both rolling and forging billets is noted, mills in this district continuing to enter orders equal to and in instances in excess of capacity. Aggregate bookings of 6000 tons last week, mostly in small and moderate lots, are reported by one maker. Considerable business is still coming from Western consumers. Prices are strong, no difficulty being experienced in obtaining $24.40 to $25.40 for soft basic open hearth rolling billets, and $29.40 minimum for ordinary forging billets, delivery in buyers' yards in this vicinity.

Plates.—There is still a large volume of business coming to mills in this district. Deliveries, which a few weeks ago could have been made in 10 to 15 days, are now more extended, three to four weeks being about the best that can be done, while on some classes of plates no better than six to seven weeks can be done. Eastern mills are rapidly approaching conditions regarding delivery which have prevailed in Western mills for some weeks. Premiums are still being paid for prompt shipment, varying from $1 to $4 a ton, according to circumstances. Mills are receiving heavy specifications on contracts, particularly for structural and boat plates. Universal plates are in good demand and usually command $1 advance, 1.50c. minimum for delivery in this district being quoted. Ordinary plates, one-quarter inch and thicker, are available, however, at 1.45c. to 1.50c., delivered here. Developments in pending export business move slowly.

Structural Material.—While very few projects of any size, either in plain or fabricated structural material, have developed, a very fair volume of current miscellaneous business in plain shapes is moving. In a number of cases 1.50c., delivered, is the minimum quotation for small orders, with 1.45c. named on desirable orders, although $1 premium has been paid in instances for prompt deliveries. Mills have received heavy specifications for shapes and are operating at close to full capacity, being restricted to some extent by the continued labor scarcity.

Sheets.—Eastern mills are receiving orders in larger aggregate quantities than placed during the same period last month and deliveries in two to three weeks are considered good. Deliveries on Western sheets are also reported to be hardening. Western No. 10 sheets are quoted at 1.60c., delivered here. Eastern mills,

however, making loose, smooth-rolled sheets easily obtain an advance of ¼ to ½ cents per pound.

Bars.—A trifle better demand for both iron and steel bars is reported. Steel bar makers have entered a fair amount of business at 1.40c., delivered, some 1000-ton contracts being reported. Iron bar makers, while not booking heavy orders, are obtaining 1.32½c. minimum more freely and reports of shading are less frequent; 1.32½c. to 1.37½c., delivered here, about represents the market for the general run of iron bars.

Coke.—Prices of furnace coke show indications of weakness, although concessions have not been general. Some makers are still holding at $2.50 at oven, for contract coke, although offerings of Connellsville, for delivery over the last half, have been made at $2.30. Moderate sales of spot furnace coke have been made at $2.20, while a sale of a round lot of stock coke at $2 at oven is noted. Foundry coke moves slowly, sales are usually made at $2.40 to $2.50 at oven, although some contracts for second half at $2.75 have been made. The following range of prices, per net ton, is named for delivery in buyers' yards in this vicinity:

Connellsville furnace coke	$4.10 to $4.70
Connellsville foundry coke	4.55 to 4.70
Mountain furnace coke	3.70 to 4.30
Mountain foundry coke	4.15 to 4.30

Old Material.—There has been a little movement in some grades, but the market, on the whole, still drags. Small lots of No. 1 heavy melting steel have been taken by consumers at $13.50, delivered, while one lot of several thousand tons was sold at $14. Offers of $16.50, delivered, have been made for low phosphorus scrap without finding sellers. Wrought iron is a shade more active, and greater strength is shown in cast borings. Mills in need of material will pay full prices, but sellers are not forcing business. Quotations are, to a large extent, nominal, the following range about representing the market for prompt deliveries in buyers' yards, eastern Pennsylvania and nearby points, taking a freight rate varying from 35c. to $1.35 per gross ton:

No. 1 heavy melting steel scrap and crops	$13.50 to $14.00
Old steel rails, rerolling (nominal)	14.75 to 15.25
Low phosphorus heavy melting steel scrap	16.50 to 17.00
Old steel axles	17.50 to 18.00
Old iron axles	24.00 to 25.00
Old iron rails (nominal)	16.50 to 17.00
Old car wheels	14.00 to 14.50
No. 1 railroad wrought	15.50 to 16.00
Wrought iron pipe	12.50 to 13.00
No. 1 forge fire	12.00 to 12.50
No. 2 light iron (nominal)	7.00 to 7.50
Wrought turnings	10.50 to 11.00
Cast borings	9.75 to 10.00
Machinery cast	13.75 to 14.25
Grate bars, railroad	10.50 to 11.00
Stove plate	10.50 to 11.00
Railroad malleable (nominal)	12.00 to 12.50

Cleveland

CLEVELAND, OHIO, July 23, 1912.

Iron Ore.—Some new inquiry for ore has come out from furnace interests which did not place contracts early in the season because their furnaces were out of blast and it was uncertain when they would be blown in. These companies are now planning to start up their stacks later in the season and will place orders for their ore requirements. While shipments down the lakes continue heavy it is doubtful if the record breaking movement of June will be exceeded during July. There is not enough ore or coal to supply cargoes for all of the boats in commission and as a result lake freighters are being delayed considerably at both upper and lower lake ports. We quote prices as follows: Old Range Bessemer, $3.75; Mesaba Bessemer, $3.50; Old Range non-Bessemer, $3.05; Mesaba non-Bessemer, $2.85.

Pig Iron.—There is a fair demand for foundry iron for the last half delivery. A number of contracts were placed during the week by northern Ohio foundries for lots of 500 tons and under, and several inquiries are pending. The 1000 tons of No. 2 foundry wanted by an Erie, Pa., consumer, noted last week, was taken by a Cleveland interest for shipment from this city at $12.75, at furnace. This low price caused considerable surprise in view of the fact that the market is generally very firm, and has not affected other sellers who are firmly adhering to recent quotations. The interest that took this business has been a low seller in this market, but recently appears to have been adhering more generally to regular quotations, and announces that on the general run of inquiries its price is $13.50, at furnace. Other sales for shipment from Cleveland were made at $13.50 for No. 2. This price appears to be firmly maintained for contracts for the last half by Valley furnaces. For shipment outside of the Cleveland territory we note the sale of one 500-ton lot and one 1000-ton lot. No inquiry came out in the city to test the advance in price to $14 for No. 2, delivered, Cleveland, made a few days ago by one local producer. A North Central Ohio manufacturer is in the market for 800 tons of No. 2 foundry for the last half. Another inquiry that is being figured on by local sellers is from Pittsburgh for 2000 tons of Southern gray forge for delivery during the next two months. For prompt shipment and for the last half we quote, delivered Cleveland, as follows:

Bessemer	$15.15
Basic	$13.75 to 14.00
Northern No. 2 foundry	13.75 to 14.00
Southern No. 2 foundry	15.60 to 16.10
Gray forge	13.25 to 13.50
Jackson Co. silvery, 8 per cent. silicon	17.55

Old Material.—New demand is light and prices are not so firm as they were the previous two or three weeks. This is due largely to the fact that mills are not taking material on contracts. Four local mills are refusing to accept shipments. Two of these have all the scrap they need for the present and the other two are holding back on shipments because of the scarcity of labor. Some dealers are offering scrap at present prices but others are not inclined to sell, expecting somewhat better prices a little later. Dealers prices, f.o.b. Cleveland, are as follows:

Per Gross Ton.

Old steel rails, rerolling	$12.75 to $13.00
Old iron rails	14.00 to 14.50
Steel car axles	17.50 to 18.00
Heavy melting steel	12.25 to 12.75
Old car wheels	13.00 to 13.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	10.50 to 11.00
Railroad malleable	12.75 to 13.00
Light bundled sheet scrap	9.50 to 10.00

Per Net Ton.

Iron car axles	$18.50 to $19.00
Cast borings	7.25 to 7.50
Iron and steel turnings and drillings	7.75 to 8.00
Steel axle turnings	8.50 to 8.75
No. 1 busheling	10.75 to 11.00
No. 1 railroad wrought	12.00 to 12.25
No. 1 cast	11.25 to 11.75
Stove plate	9.00 to 9.50
Bundled tin scrap	11.00 to 11.50

Coke.—That prices on furnace grades are not so firm as they have been is indicated by the reports of a local interest that it has received during the past few days a number of quotations from operators of $2.20 to $2.25 for standard Connellsville furnace coke for contracts covering six months. This interest has been considering the blowing in of a furnace provided it could secure coke at satisfactory prices, but with the present prices of pig iron, it will probably not start up its stack unless a considerable further concession is made in coke prices. Foundry coke is firm at $2.75 per net ton for standard 72-hr. Connellsville grades. The demand is heavy but there is little new inquiry as consumers are nearly all under contract.

Finished Iron and Steel.—Specifications on contracts are coming out in a very large volume. The consumption of all kinds of finished steel is heavy as a result of the generally improved condition of manufacturing industries in various metal working lines and consumers as a rule are ordering the monthly proportion of their contracts. Because of slow deliveries manufacturers are anticipating their requirements and ordering as far ahead as possible. Deliveries on steel bars, plates and structural material are getting further behind and consumers are being put to much inconvenience by not securing material as needed. New demand is light. There is not much inquiry for contracts. New business consists largely of small lots wanted for immediate delivery. Buyers are more concerned about the delivery than the price and are paying premium prices of $5 a ton on steel bars and $4 to $5 a ton on plates and shapes for quick shipment. In structural lines fabricators are getting a good volume of small work. A fair amount of large work is in prospect, although no inquiries of any size came out during the week. The Massillon Bridge & Structural Company has taken 250 tons for a new building for the Massillon Rolling Mill Company, Massillon, Ohio. Little inquiry for sheets has come out since the recent advance in prices but the higher prices are not being asked by all of the mills. We quote sheets at 2c. for No. 28 black, and 3.05c. to 3.10c. for No. 28 galvanized. The scarcity of steel bars for early delivery has resulted in a heavy demand for hard steel bars for reinforcing purposes. The latter are now selling at 1.20c. for car loads and at 1.25c. for less than car loads. The demand for iron bars continues active and prices are firmer. We quote

iron bars at 1.35c. to 1.40c., Cleveland mill. The demand for forging billets is quite active and we quote forging billets at $29, Cleveland.

Cincinnati

CINCINNATI, OHIO, July 24, 1912.—*(By Telegraph.)*

Pig Iron.—Southern prices are stiffening and $11.50, Birmingham basis, is minimum for No. 2 foundry for either prompt or third quarter shipment and a few producers are holding their make at $12 for any shipment this year. The inquiry in this territory is on the mend, and there is an unquestioned improvement in the foundry melt. The fast increasing consumption of foundry iron in the South and Southwest has afforded an outlet for Birmingham iron that has been apparently overlooked by users in other parts of the country. Several sales of Northern No. 2 foundry have been made slightly below $13.50, Ironton, which is the present price for either prompt or last half shipment, but this was speculative material and it is hardly probable that more than a very limited quantity is yet obtainable below the established quotation named. At $13.50, Ironton, a central Ohio melter booked 400 tons of No. 2 foundry for shipment throughout the remainder of the year. Other smaller sales to nearby consumers were made at the same price for third quarter movements. Southern iron sales include 600 tons of No. 2 foundry to an Ohio company as well as miscellaneous smaller lots to local and Indiana customers. Although several manufacturers have been feeling the market for prices for the first quarter of next year, no orders have yet been booked so far as is known. A central Ohio melter is expected to close for 600 tons of Northern foundry this week and the 1000 tons inquiry from the same territory previously mentioned is yet unclosed. A small tonnage of Southern charcoal was taken by an Ohio firm at $23, Birmingham, for August-September shipment. Malleable is very quiet. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry and 1 soft	$15.00 to $15.50
Southern coke, No. 2 foundry and 2 soft	14.75 to 15.00
Southern coke, No. 3 foundry	14.25
Southern coke, No. 4 foundry	14.00
Southern gray forge	14.00
Ohio silvery, 8 per cent. silicon	17.20 to 17.70
Lake Superior coke No. 1	14.95
Lake Superior coke, No. 2	14.70
Lake Superior coke, No. 3	14.45
Basic, Northern	14.45
Standard Southern car wheel	25.75 to 26.00
Lake Superior charcoal	16.75 to 17.25

(By Mail)

Coke.—A Southern furnace operator is figuring through a local agency for a six months' supply of 48-hr. coke; between 15,000 and 25,000 tons will be contracted for. This is the only inquiry for furnace coke before the trade here. The Northern furnaces are scrapping around and buying to cover immediate requirements only, as they are unwilling to pay the present prices demanded, especially in the Connellsville field. There is not a very urgent demand for spot furnace coke, even under present conditions, and while a number of furnaces have been able to pick up small lots at $2.25 Connellsville, the majority of producers in that district are unwilling to accept business below $2.40 to $2.50 per net ton at oven. Wise County operators have stiffened quotations somewhat, and are now holding out for $2.10 to $2.25 per net ton at oven for leading brands of 48-hr. coke, the first named price representing the average spot shipment price. In the Pocahontas field the situation is unchanged, with $2 quoted for prompt shipment and around $2.10 to $2.20 for contract business. Foundry coke is about the same in both the Connellsville and Wise County fields, and is obtainable for immediate shipment at $2.50 with a premium of 15c. to 25c. on future contracts. Pocahontas prices range from $2.25 to $2.50 per net ton at oven. The foundry demand is improving.

Finished Material.—On account of the slow deliveries from the mills, local warehouses are experiencing a period of very good business. Steel bars and structural material, cut to lengths, are in excellent demand. There is also some improvement in wire nails, as well as in hoops and bands. Steel bars are firm at 1.25c. Pittsburgh basis, and structural material at 1.30c. Local warehouse quotations are 1.70c. to 1.75c. for steel bars and 1.85c. for structural material.

Old Material.—The dealers are expecting an improvement in the situation, but it has not yet materialized as many of the mills, which are large consumers of scrap, have been closed down for the usual summer repairs. The railroad embargoes on shipments, as well as the scarcity of labor, has also had something to do with the present stagnant business in the scrap material line. The minimum figures given below represent what buyers are willing to pay for delivery in their yards, southern Ohio and Cincinnati, and the maximum quotations are dealers' prices f.o.b. at yards:

Per Gross Ton.	
Bundled sheet scrap	$9.00 to $9.50
Old iron rails	12.75 to 13.25
Relaying rails, 50 lb. and up	20.00 to 21.00
Rerolling steel rails	11.00 to 11.50
Melting steel rails	10.00 to 10.50
Old car wheels	12.25 to 12.75
Per Net Ton.	
No. 1 railroad wrought	$10.50 to $11.00
Cast borings	6.25 to 6.75
Steel turnings	7.00 to 7.50
No. 1 cast scrap	10.75 to 11.75
Burnt scrap	7.50 to 8.00
Old iron axles	16.50 to 17.00
Locomotive tires (smooth inside)	11.75 to 12.25
Pipes and flues	7.00 to 7.50
Malleable scrap	8.50 to 9.00
Railroad tank and sheet scrap	6.50 to 7.00

Birmingham

BIRMINGHAM, ALA., July 22, 1912.

Pig Iron.—Alabama pig iron has never before in its history occupied quite the position that it does now. Every week adds to the unique feature of the furnace companies having little to sell on a rising market. Heretofore such a condition has produced all the tonnage the consumer desired. A summary of the situation shows that one of the three largest interests has no iron for the general market, except perhaps for regular and preferred customers, and then at $12, for the rest of the year. Another, after selling 3000 tons one week and 7000 tons the next week at $12 for fourth quarter delivery, turned down similar offers this week with the exception of one at $12, which was for 400 tons for fourth quarter. This company is afraid to bill heavily against production for the rest of the year. A third large interest, although it has blown in another furnace, is behind on delivery and not anxious to book more business for fourth quarter. The one company with stocks on hand is reported as selling some iron for fourth quarter under $12, with $11.75 the practical minimum for spot delivery on standard iron. A smaller concern, which manufactures a special brand, is securing $13, sales having been made during the week. Only one company has stocks worth mentioning on hand, the total of free foundry on Alabama yards being 63,000 tons. The quotation of lower prices at strictly competitive points makes no difference when standard Southern iron is as scarce and local consumption is so large compared with the output. Several additional furnaces would have to blow in to alter the situation. What the eventual outcome of this peculiar status will be remains to be seen, but it is certain that for the time being the Alabama operators have nothing to worry about with the exception of meeting shipment specifications and furnishing much more iron for fourth quarter at $12 than seems forthcoming. Steel mills are operating on full time and so are water pipe foundries, thus consuming an enormous quantity of iron at home. It may be a temporary affair, but it begins to look as if Alabama iron has at last found the home outlet which renders it stable. From 3000 to 4000 tons of charcoal iron has been sold this month at $22.50. Lowest prices, f.o.b. cars at Birmingham, for standard iron, are as follows:

No. 1 foundry and No. 1 soft	$12.00
No. 2 foundry and No. 2 soft	$11.50 to 11.75
No. 3 foundry	11.00 to 11.25
No. 4 foundry	10.75 to 11.00
Gray forge	10.50 to 10.75
Basic	10.75 to 11.25
Charcoal iron	22.50 to 23.00

Cast-Iron Pipe.—All the water pipe plants are shipping their make, and the make is the output of operating on full time. While no larger order than one for 1500 tons has been reported recently, the outlook is for steady operations for several months. Prices are unchanged, as follows, per net ton: 4 in., $24; 6 to 8 in., $22; 10 in. and over, $21.50, with gas pipe, $1 extra.

Coal and Coke.—Orders for steam coal, owing to the approach of operations in oil and fertilizer mills and other plants about to resume, are on the increase. The coal trade will easily take care of itself for months to come. Coke is firm at $3.25 to $3.75 per net ton at oven. Virginia coke makers have to face a high freight rate, which keeps them out of the Alabama market. This, coupled with increased furnace capacity, argues well for Alabama coke.

Old Material.—Light cast and machinery scrap are in demand, with stocks low on the yards. The old material market has manifested additional strength. Several thousand tons of wrought and steel scrap have been disposed of. Prices are somewhat firmer, with the following quotations per gross ton adhered to at local yards:

Wrought iron car axles	$15.00 to $16.00
Old steel axles	13.50 to 14.50
Old iron rails	13.50
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	10.00
No. 1 country wrought	8.50 to 9.00
No. 2 country wrought	8.00 to 8.50
No. 1 machinery	9.00 to 9.50
No. 1 steel	10.00 to 10.50
Tram car wheels	10.00 to 10.50
Standard car wheels	11.50 to 12.00
Light cast and stove plate	8.00 to 8.50

St. Louis

ST. LOUIS, MO., July 22, 1912.

While there is some tendency toward quietude, it is mostly due to the advance in pig iron. Furnace representatives believe that buyers will come into the market again within a short time, as needs are growing pronounced and furnaces are behind in shipments.

Pig Iron.—Business has been confined to small lot orders and specifications on contracts, but the total handled has been satisfactorily large. There are no new inquiries of importance but consumers are expected to re-enter the market in short time. The new price is firmly held, with the possible exception of one or two furnaces which are usually 25 to 50 cents under the rest, but which do not materially affect the market quotations by their position. All representative agencies are holding No. 2 Southern at $12, Birmingham basis.

Coke.—Movement on contracts continues up to the mark, but there have been no inquiries for any round lots. Figures remain here as last quoted. By-product coke is quotable at $5.50 to $5.75 delivered St. Louis, but the producers report themselves pretty well sold up and are rather indifferent to possible inquiries.

Old Material.—The local market for scrap is in a rather troublesome state. The consumers are trying to hold the prices down, while the dealers, aided by quotations at other centers, are getting along very comfortably by sending material to other points and taking profits out of the differences in price. The yards here are pretty well cleaned up and there is a likelihood that the local consumers may find themselves before long without material. The only list out during the week was one from the Chicago & Eastern Illinois of about 600 tons. We quote dealers' prices, f.o.b. St. Louis, as follows:

Per Gross Ton.	
Old iron rails	$14.00 to $14.50
Old steel rails, rerolling	11.00 to 11.50
Old steel rails, less than 3 ft.	9.50 to 10.00
Relaying rails, standard section, subject to inspection	22.50 to 23.00
Old car wheels	13.50 to 14.00
Heavy melting steel scrap	10.00 to 10.50
Frogs, switches and guards cut apart	10.00 to 10.50

Per Net Ton.	
Iron fish plates	$12.00 to $12.50
Iron car axles	17.00 to 17.50
Steel car axles	15.50 to 16.00
No. 1 railroad wrought	10.00 to 10.50
No. 2 railroad wrought	9.00 to 9.50
Railway springs	8.50 to 9.00
Locomotive tires, smooth	11.50 to 12.00
No. 1 dealers' forge	8.00 to 8.50
Mixed borings	6.25 to 6.75
No. 1 busheling	9.00 to 9.50
No. 1 boilers, cut to sheets and rings	7.50 to 8.00
No. 1 cast scrap	10.50 to 11.00
Stove plate and light cast scrap	8.00 to 8.50
Railroad malleable	9.50 to 10.00
Agricultural malleable	8.00 to 8.50
Pipes and flues	7.50 to 8.00
Railroad sheet and tank scrap	7.50 to 8.00
Railroad grate bars	8.50 to 9.00
Machine shop turnings	7.00 to 7.50

Finished Iron and Steel.—There has been a considerable demand for light rails from the coal interests, which are making repairs and extensions for their fall business. In standard rails there have been no large sales or inquiries, though there are several out for lots of 500 tons for special purposes. One sale of 500 tons to the Missouri & North Arkansas Railroad has been made and the others pending are likely to be made during the week. In structural material the orders continue to come in and buyers, recognizing the congested condition of the mills, are evincing a willingness to take their material from stock sizes and shapes where possible, or to wait for mill deliveries which are more extended than ever. Quick shipment demands are yielding to the situation. In bars the aggregate business for the week has been very satisfactory. Plates are increasingly hard to get and premiums are being offered, but without much effect. Track fastenings are firm at the last advance, $1.60 Pittsburgh, and deliveries are more than ever delayed, while car orders contemplated by some of the southwestern roads are being withheld because of the doubt as to delivery.

Buffalo

BUFFALO, N. Y., July 23, 1912.

Pig Iron.—The market is very firm, although quiet conditions continue. Sales for the week have been light. Shipments on contracts are very heavy, all of the iron being produced going out as fast as it is made. A large proportion of Eastern and seaboard point shipments are now moving via Erie Canal. Consumption by melters is apparently growing in volume, although limited to some extent by the difficulty in obtaining the requisite supply of labor. This feature is seriously tending to restrict output. Furnacemen are looking for a very active market a little later, the general opinion being that a large amount of supplementary business will be placed by melters early in the fall. The price situation is very strong and schedules are firmly held at the slight advance shown last week. We quote as follows f.o.b. Buffalo, for current quarter and last half delivery:

No. 1 X foundry	$14.25 to $14.75
No. 2 X foundry	14.25 to 14.50
No. 2 plain	14.00 to 14.25
No. 3 foundry	14.00
Gray forge	13.75 to 14.00
Malleable	14.25 to 14.75
Basic	14.25 to 14.75
Charcoal, according to brand and analysis	15.75 to 17.50

Old Material.—The market is apparently still devoid of interest so far as local buyers are concerned, and transactions for the week, from this source, have been light. Orders from outside points have also been of small volume. Such sales as have been made to out-of-town buyers have been principally for heavy melting steel and railroad wrought, for which prices have been slightly easier. Otherwise the price schedules remain unchanged. We quote as follows per gross ton f.o.b. Buffalo:

Heavy melting steel	$12.00 to $12.75
Low phosphorus steel	15.75 to 16.00
No. 1 railroad wrought	12.75 to 13.50
No. 1 railroad and machinery cast scrap	12.50 to 13.25
Old steel axles	16.50 to 17.25
Old iron axles	21.00 to 21.50
Old car wheels	12.50 to 13.00
Railroad malleable	11.50 to 12.25
Boiler plate, sheared	13.75 to 14.25
Locomotive grate bars	11.00 to 11.25
Wrought pipe	9.50 to 10.00
Tank iron	10.00 to 10.25
Wrought iron and soft steel turnings	7.75 to 8.00
Clean cast borings	7.00 to 7.25

Finished Iron and Steel.—The urgent need of consumers for material reported last week continues. There is no abatement of the pressure on mills for deliveries on contracts. Many users find they are not covered sufficiently to take care of requirements for third quarter, consumption having largely exceeded their estimates, and they are endeavoring to place further orders. This is proving to be difficult, except at premium prices. A majority of the mill agencies have instructions not to accept orders of more than very moderate size without first consulting the mill. The demand for railway and car building material is heavy, rail orders coming in in large volume, and spikes being active at the advance made last week. The advance on wire products announced by the leading interest last Saturday of $1 per ton has been followed by the leading independent manufacturers, and it is considered quite probable this advance will be followed by a further advance in the near future. It is stated that considerable business was placed at the former price just previous to the advance. In fabricated structural material good demand is noted and a large amount of new business is developing. Bids are to be taken next week for steel for four new buildings for the King Sewing Machine Company, Buffalo, taking about 400 tons. The Buffalo Structural Steel Company was low bidder for the addition to the Crosby Company's plant, Buffalo, 700 tons, and will supply the steel for the Underwood Building, Buffalo, 200 tons. Contract for the Defender Photo Supply Company's factory, Rochester, was let to the F. L. Hughes Company, that city. The Lane Bridge Company, Painted Post, N. Y., received the contract for the manufacturing plant for the Clark Bros. Company,

Olean, N. Y., taking 400 tons of steel, and Smith & Coffrey, Syracuse, have received steel contract for a large factory building for L. & J. G. Stickley, Fayetteville, N. Y.

Boston

BOSTON, MASS., July 23, 1912.

Old Material.—Prices are firm, with a prevailing sentiment that an advance will follow sharply after the close of the vacation season. Conditions have changed but slightly in the past week. The quotations given below are of prices offered by the large dealers to the producers and to the smaller dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points, taking Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of $2.30 a ton is included. Mill prices are approximately 50c. a ton more than dealers' prices.

Heavy melting steel	$10.25 to $10.75
Low phosphorus steel	11.45 to 11.95
Old steel axles	14.00 to 14.50
Old iron axles	17.00 to 18.00
Mixed shafting	13.00 to 13.50
No. 1 wrought and soft steel	10.00 to 10.50
Skeleton (bundled)	8.25 to 8.75
Wrought iron pipe	9.25 to 9.75
Cotton ties	7.75 to 8.25
No. 2 light	4.50 to 5.00
Wrought turnings	7.25 to 7.75
Cast borings	6.25 to 6.75
Machinery, cast	12.50 to 13.00
Malleable	8.75 to 9.25
Grate bars	6.00 to 6.50
Stove plate	8.00 to 8.50
Cast iron car wheels	11.75 to 12.00

The British Market Holds Well

Pig Iron Higher, with Big Speculative Buying

(*By Cable*)

MIDDLESBROUGH, ENGLAND, July 24, 1912.

The general situation is shaping excellently. More inquiry is coming out for semi-finished steel for last quarter. All prices are firm, except that some tin plate makers are taking slightly easier prices for desirable specifications. The German Verband is behind on deliveries. Southern blooms have been sold at 110s. delivered. Birmingham inquiry for American ship plates is developing. Pig iron stocks in Connal's stores have shrunk 2985 tons in the week to 295,362 tons. We quote as follows:

Cleveland pig iron warrants (closing Tuesday), 58s. 2½d., against 56s. 10½d., one week ago, with big speculative buying.

No. 3 Cleveland pig iron, maker's price, f.o.b. Middlesbrough, 58s. 9d., against 57s. 6d., one week ago.

Steel sheet bars (Welsh) delivered at works in Swansea Valley, £5 17s. 6d.

German 2-in. billets, f.o.b. Antwerp, 100s.

German basic steel bars, f.o.b. Antwerp, £5 17s.

Steel bars, export, f.o.b. Clyde, £7 15s. to £7 17s. 6d.

Steel joists, 15-in. export, f.o.b. Hull or Grimsby, £7.

Steel ship plates, Scotch delivered local yard, £7 17s 6d.

Steel black sheets, No. 28, export, f.o.b. Liverpool, £9 2s. 6d.

Steel rails, export, f.o.b. works port, £6 7s. 6d. to £6 10s.

Tin plates, cokes, 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 14s. 7½d., October-December.

The Continued Heavy Depletion of Pig Iron Stocks—Recent Speculation in Iron Warrants

(*By Mail*)

MIDDLESBROUGH, July 13, 1912.

Strength and weakness have alternated in our warrant iron markets, but while the weakness has only been apparent in Cleveland, which is subject to speculative influences, in all other districts there has been nothing but an unyielding attitude observable on the part of makers. Of course, in warrant iron there has been a lot of speculation, latterly of a rather ragged character, and this has introduced an undesirable element into the market which some of the big people did not care for and, indeed, were rather anxious to see eliminated. Hence when Dick, Tom and Harry began to climb into Cleveland iron for a "spec" round 56s. for future deliveries, the big people first rushed up the price against them and then hit the market and produced a little scare, which brought weak holders tumbling over one another to get out.

In its actual bearings the position is really as sound as a bell, for consumption is far ahead of output, with the result that there is a continual drain upon the resources in public warehouses, which bid fair in the course of a few days to fall below 300,000 tons, and the unceasing reduction is beginning to make a serious impression upon the minds of many in the trade. Cleveland iron is indeed in a wonderfully good position, and in the Middlesbrough dock today there are not sufficient berths at the quays for the vessels waiting to load, steamers consequently having to be moored and wait their turn to get alongside to take in iron. Prices of No. 3 Cleveland warrants reached the apex of the present movement some days ago at about 58s. 3d. for three months' delivery, the figure not being maintained for the reasons set forth.

This week the tendency shapes toward irregularity, a very usual phase under such conditions as those which presently affect speculative iron, but in the Midlands just as firm a front as ever is presented by the furnace owners. The key to the general position in the near future lies probably in the after effect of the recent quarterly meeting of ironmasters held in Birmingham. This went off remarkably well and increasing scarcity was reported of hematite, relief to a moderate extent being forthcoming from Germany, which has sold 8000 tons to English works.

A big inquiry for semi-finished steel has developed, but business has not been closed of any magnitude. Local steel makers in the Midlands ask £6 for sheet bars. The United States Steel Corporation wants 110s. c.i.f. for sheet bars, and Belgian billets have been done at 111s. 6d., delivered in the Birmingham district. The Verband are open to negotiate for October-December business, but announce that they have not got much available. The galvanized sheet makers are somewhat indifferently employed, but the market for tin plates has an improving tendency.

The German Iron Market

BERLIN, July 12, 1912.

Work is proceeding in the various districts at the full capacity of blast furnaces and mills. The Rivet Association voted several days ago an advance on ship, bridge and boiler rivets of 5 marks a ton, the increased cost of material being given as the ground for the advance. The same cause is about to lead to a rise in kitchen utensils, a meeting of manufacturers and wholesalers having decided several days ago that the advance is necessary.

The price situation in Belgium appears to be somewhat mixed. At the end of last week a cut of one shilling in export prices of bars (both basic and wrought iron) and plates was reported; but this week the home price of pig has been raised one franc—basic to 80.50, puddling to 75 and foundry to 81 francs. As further evidence of the strength of the Belgian market, it is mentioned that the offers from there for Luxemburg basic, previously mentioned in this correspondence, have just been renewed, but the Syndicate has again felt compelled to reject them owing to disagreement as to price.

The Pig Iron Trade in Strong Position

It is evident that the German pig iron trade is in an exceedingly strong position. Although shipments in June were unusually heavy and exceeded the allotments, the total amount on the Syndicate's books for this half year is still above 3,000,000 tons. At a meeting this week of the Syndicate it was reported that the home trade is somewhat quieter owing to the fact that nearly all consumers have already arranged for their requirements to the end of the year, but small supplementary amounts continue to be called for. It is added that the foreign demand remains active, with prices still tending upward, both for foundry iron and for ferromanganese. Shipments in June exceeded allotments for the first time this year.

The production of pig in June reached 1,418,445 metric tons, which is somewhat less than for the three previous months. High-water mark was touched in May with 1,463,610 tons. The June production, however, exceeded that of June, 1911, by 155,448 tons, and the percentage of gain over that month was greater than for any previous month of this year over 1911. The make for the past half year amounted to 8,424,632 tons, which was 741,993 tons more than for the parallel period of 1911. The July output will probably create a

new record, as two of the Thyssen furnaces at Hagendingen, producing each 300 tons a day, have just been blown in, besides a third furnace at another establishment.

The Steel Syndicate Doing Well

June shipments of the Steel Works Union reached about 604,000 tons in semi-finished material, rails and structural shapes, against, 535,726 tons in May. Trade reports on these products remain satisfactory. Work in semi-finished steel is very heavy, and complaints are still heard about scarcity of material; the quotas assigned to the various members for production run well above their allotments. A heavy demand from abroad, particularly from England, is mentioned. In steel rails further foreign orders have been taken, and the total bookings have been somewhat increased. The unsatisfactory position of the money market continues to depress the building trades, which reacts unfavorably upon the home demand for structural shapes, but the foreign demand fully compensates for the slackness in home business.

The Bar Trade in Good Shape

The price cutting in bars previously reported has this week rather dropped out of consideration. It is now emphasized that some of the mills are supplied with work to about the end of the year, and that this fact alone proves the strong position of this section of the trade; specifications, moreover, are coming in very fast. The situation in the plate and sheet market remains most satisfactory. The shipyards continue to order plates in considerable amounts, and their specifications are coming in briskly. Fine sheets have also been bought actively, and the mills are about sold out to the end of the year.

There is also plenty of work in wire and wire rods, but makers of wire nails complain that their selling prices are still too low for earning satisfactory profits. Wire rod shipments in June reached 43,500 tons, or 2000 tons more than in May. The negotiations for the renewal of the Wire Rod Association are still going on, but it is reported that little, if any, progress is making. There is a conflict of interest between the big mixed producers and the purely wire rod mills, owing chiefly to the big allotment demands of the former class.

Efforts are being made to establish a price convention among lock manufacturers, and the makers of bolts and latches are again trying to establish a common selling agency, but it is uncertain whether anything will come of these movements.

The project previously reported for establishing a steel mill at Lübeck in connection with the furnace plant there has fallen through, owing to the inability of the promoters to get together the necessary capital.

New York

NEW YORK, July 24, 1912.

Pig Iron.—A fair volume of business has been done, but, with the possible exception of some New England contracting, transactions were only in moderate-sized lots. Inquiry is light, but sales agencies are not exerting themselves to stimulate the demand, as pig iron makers are advising care in taking contracts in view of the possibilities of increased cost of production. Considerably more foundry iron is believed to be needed by consumers in this district for the remainder of the year. Consumers comment on the unanimity with which salesmen maintain a firm attitude in naming prices. Lehigh Valley pig iron makers are marking up prices another notch, and some of the Buffalo makers have also raised their quotations 25 cents per ton. We quote as follows for Northern iron at tidewater: No. 1 foundry, $16 to $16.25; No. 2X, $15.75 to $16; No. 2 plain, $15.25 to $15.50. Southern iron is quoted at $15.75 for No. 1 foundry and $15.50 to $15.75 for No. 2 foundry.

Finished Iron and Steel.—The absorbing feature of the market continues to be the question of belated deliveries, occasioned by the crowded condition of the mills. While new business as distinguished from specifications on contracts is remarkably good for this time of the year, the magnitude of the new business does not compare with the movement in the latter half of June. The sentiment continues highly favorable and it is generally believed that a good run of business will continue for a number of months, architects and builders having considerable in the way of building construction under advisement, though fabricators are not at the moment particularly busy closing contracts. The greatest activity appears to lie in railroad purchases, including those of cars. The inquiry from Scotland for 50,000 tons of plates appears to be accompanied by an activity of foreign commission houses anxious to place the business and has seemingly resulted in ship owners rather sharply raising freight rates, a condition which is likely to be reflected in a higher quotation than would probably otherwise be made were the publicity through the activity of the commission agencies lacking. Universal plates in this market continue strong and 1.35c. Pittsburgh is also not uncommonly asked for sheared plates. The volume of business in bar iron has shown a slight reduction compared with the week preceding. Not many structural awards have been learned. They include 900 tons for a building on West End avenue and Ninety-second street, and the second section of what is called a community building, 163d street and Southern Boulevard, 1200 tons in all, to the Hinkle Iron Company; 1200 tons for a loft on West Twentieth street and 600 tons for an Italian Mission school, Hester street, to Levering & Garrigues Company. The New York Central is inquiring for about 100 tons of structural and other material for the Rochester station. The total number of railroad cars closed aggregate probably more than 10,000. For the Denver & Rio Grande, 100 stock cars were placed with the American Car & Foundry Company; 700 box cars, with the Standard Steel Car Company; 50 caboose, with the Haskell & Barker Car Company; 350 gondola, with the Pressed Steel Car Company. For the Central Railroad of New England, 900 box cars, 100 automobile cars and 50 caboose, all to the Keith Car & Mfg. Company. For the Boston & Albany, 3000 box cars to the American Car & Foundry Company; 1000 box cars to the Keith Car & Mfg. Company; 800 general service to the Pressed Steel Car Company; 400 flat cars to the Standard Steel Car Company; 20 coaches to the American Car & Foundry Company, and 8 postal cars to the Pullman Company. For the Canadian Pacific, 1000 cars to the Barney & Smith Car Company, in addition to the 1000 taken by the American Car & Foundry Company. For the Erie, 500 so-called battleship coal cars to the Pressed Steel Car Company; 200 automobile to the American Car & Foundry Company, and 25 coach and 11 passenger and baggage cars to the Standard Steel Car Company. The Pennsylvania Lines West are in the market for 1000 automobile cars, and the Buffalo, Rochester & Pittsburgh for 500 gondolas, 500 box cars, 100 automobile and 100 refrigerator cars. Quotations are: Steel bars, 1.41c. to 1.46c.; plain structural material and plates, 1.46c. to 1.51c.; bar iron, 1.32c. to 1.37c., all New York; plain material from store, 1.85c. to 1.95c.

Cast-Iron Pipe.—Manufacturers report a great run on pipe of small sizes. The demand for this class of product has continued for some time, but still appears far from satisfied. While no public buying of consequence is reported, the demand from private consumers is steadily putting the foundry order books in better condition. Prices of carload lots of 6-in. are continued at $22 to $23 per net ton, tidewater.

Old Material.—While the market generally is dragging, a few buyers have been apparently driven by their necessities to cover at least part of their requirements, and some sales are therefore reported of heavy melting steel scrap and rolling mill stock. It would seem to be somewhat easier to make sales on a moderate scale than has heretofore been the case. Although dealers are not looking forward to any immediate buying in considerable quantities, yet they feel that the extreme dullness of the midsummer is about past. Prices are well maintained all along the line. We quote dealers' prices per gross ton, New York and vicinity, as follows:

Old girder and T rails for melting	$11.00 to $11.50
Heavy melting steel scrap	11.00 to 11.50
Relaying rails	20.50 to 21.00
Rerolling rails (nominal)	12.50 to 13.00
Iron car axles	20.50 to 21.00
Old steel car axles	15.00 to 15.50
No. 1 railroad wrought	13.25 to 13.75
Wrought iron track scrap	12.00 to 12.50
No. 1 yard wrought, long	11.50 to 12.00
No. 1 yard wrought, short	10.75 to 11.25
Light iron	5.00 to 5.25
Cast borings	7.00 to 7.25
Wrought turnings	8.25 to 8.50
Wrought pipe	10.00 to 10.25
Old car wheels	13.00 to 13.50
No. 1 heavy cast, broken up	11.00 to 11.50
Stove plate	8.25 to 8.50
Locomotive grate bars	8.75 to 9.25
Malleable cast	10.00 to 10.50

Ferroalloys.—In the last few days between 8000 and 10,000 tons of ferromanganese has been sold, mostly for delivery in the first half of next year, at $48.50, Balti-

more. Early delivery ferromanganese is commanding $50 to $52.50 for small lots, and at least one seller quotes $50 as a price for delivery throughout this year and the first half of next. Of the large quantity sold at the $48.50 price, about 2500 tons was disposed of in the East. The market for 50 per cent. ferrosilicon is quiet but steady at $72.50 for carload lots and $71.50 for 100 tons or over within certain limits. While there have been no large sales there is fair inquiry.

Metal Market

NEW YORK, July 24, 1912

The Week's Prices

Cents Per Pound for Early Delivery.

	Copper, New York.			Lead		Spelter	
July.	Lake.	Electro-lytic.	Tin, New York.	New York.	St. Louis.	New York.	St. Louis.
18	17.37½	17.25	43.75	4.70	4.60	7.30	7.15
19	17.50	17.37½	43.55	4.70	4.60	7.30	7.15
20	17.62½	17.50	.....	4.70	4.60	7.30	7.15
22	17.62½	17.50	43.90	4.70	4.60	7.35	7.20
23	17.62½	17.62½	43.85	4.70	4.60	7.35	7.20
24	17.62½	17.62½	43.75	4.70	4.60	7.35	7.20

Copper is strong in a quiet market, following buying of both resale lots and from producers at advancing prices. Tin is dull in the face of heavy deliveries under contract with only small buying for immediate needs. Lead is quiet at unchanged prices. Spelter shows increased strength although buying is light. Antimony shows no changes.

New York

Copper.—The price of copper, after considerable buying during the upward movement in prices, is to-day held at the producers' prices of 17.75c., 30 days' delivery, or 17.62½c., cash New York, for both Lake and electrolytic in a market in which there is little demand with seemingly no pressure to sell. It is generally admitted that the large quantity of resale copper which appeared in the market a few days ago has been eliminated from the situation, it being said that between 3,000,000 and 4,000,000 lb. of such copper was taken by consumers at prices ranging between 16.75c. and 17.75c. since the market touched the low level of 16.75c. about July 10. Some sellers assert that 16.87½c. is more nearly correct as the real low figure which was reached. As a result of a steady rise which is declared to have had the usual effect of scaring consumers into the market, producers in the last week did a good business at or near 17.75c., 30 days' delivered. Some estimates place the business done at from 8,000,000 to 10,000,000 lb. The recovery in price was gradual and steady and the market is said to-day to be stronger than it was before the break in London speculative copper which precipitated the decline in the American market. London continues to fluctuate and the early cables to-day reported a decline of 15s. from yesterday's price. The price of copper in London to-day is reported at £78 5s. for spot and £78 2s. 6d. for futures, and inclined to be weak at those figures. The exports of copper this month have been 20,680 tons.

Pig Tin.—In a market that is very dull, but with prices firmly held, it now appears that tin for immediate delivery is not so plentiful as the heavy arrivals of recent date would seem to indicate. A large part of the tin now being received here is tin that was contracted for some time ago and is high price metal which, should it find its way into the market to-day, would mean a loss if sold at present prices. The buying of the last week has been almost entirely of small quantities for which there was actual immediate need. The deliveries this month against the contracts already referred to are expected to be heavy. The docking in Hoboken of vessels which bring tin from European ports is an inconvenience and a cause of extra expense to New York users of tin who buy in small quantities inasmuch as it costs about $2 per ton to get the tin to New York City. This does not affect large users who buy in carload lots and who for that reason obtain lighterage free. Tin was sold in New York to-day at 43.75c. The price in London is quoted at £198 15s. for spot and £196 for futures. The arrivals this month were 4486 tons and there is afloat 1609 tons.

Tin Plates.—There are no new features in the New York market for tin plates except that greater uniformity of price prevails and $3.74 is now quoted for 100-lb. coke plates.

Lead.—Lead is unchanged, the market continuing dull and tending toward weakness. There are said to be considerable quantities of old lead in the vicinity of New York which tends to keep the local market weak. The American Smelting & Refining Company adheres to its price of 4.75c., New York, and 4.67½c., St. Louis, while the independents quote 4.70c., New York, and 4.60c., St. Louis.

Spelter.—Based on reports from the West as to the high prices there demanded for ore the price of spelter is strong and higher for prompt shipment metal, although there does not seem to be any great demand either for early delivery or future shipment. There is a general feeling that the price of spelter is too high and consumers, who are fairly well covered for July and August, are inclined to wait for a decline. On both July 22 and 23 reports from St. Louis were that 7.20c. has actually been offered for prompt shipment spelter and only to-day information from the West was that 7.25c., St. Louis, was asked for September, October and November shipment, a price which was declared to be excessive. It is said by some who follow spelter that the prices cannot go up very much higher or they will enable foreign spelter to profitably enter the country.

Antimony.—There are no changes in antimony, which is dull. Prices quoted are 8.25c. for Cookson's, 7.87½c. for Hallett's and 7.37½c. to 7.50c. for Chinese and Hungarian grades.

Old Metals.—The demand is somewhat better and prices are firmer, but selling quotations are without change as follows:

	Cents per lb.
Copper, heavy and crucible	16.00 to 16.25
Copper, heavy and wire	15.50 to 15.75
Copper, light and bottoms	14.00 to 14.25
Brass, heavy	10.00 to 10.25
Brass, light	8.25 to 8.50
Heavy machine composition	13.00 to 13.25
Clean brass turnings	9.50 to 9.75
Composition turnings	12.00 to 12.50
Lead, heavy	4.40
Lead, tea	4.15
Zinc, scrap	5.50

Chicago

JULY 23.—While there has been a considerable volume of trading in metals the past week, prices have fluctuated but little. Tin quotations have shown some weakness, but a partial recovery was recorded at the end of the week. We quote as follows: Casting copper, 17.50c.; Lake, 17.75c. to 17.87½c., in carloads for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 45c.; small lots, 48c.; lead, desilverized, 4.65c. to 4.70c. for 50-ton lots; corroding, 4.40c. to 4.45c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 7.20c.; Cookson's antimony, 9c., and other grades, 8.50c. in small lots; sheet zinc is $8.75 f.o.b. La Salle or Peru, Ill., less 8 per cent. discount in carloads of 600-lb. casks. On old metals we quote buying prices for less than carload lots: Copper wire, crucible shapes, 14.75c.; copper bottoms, 12.75c.; copper clips, 14c.; red brass, 12c.; yellow brass, 9.25c.; lead pipe, 4c.; zinc, 5c.; pewter, No. 1, 28.50c.; tinfoil, 33c.; block tin pipe, 41c.

St. Louis

JULY 22.—Lead has softened a bit, while spelter has strengthened considerably. Tin is slightly off, but antimony is firm. Locally lead is quotable at 4.60c., spelter at 7.25c., tin at 43.90c., Cookson's antimony at 8.60c., Lake copper at 17.72½c. and electrolytic at 17.60c. In the Joplin ore district zinc blende continued its sensational upward trend, and the highest price ever reported was recorded. Predictions of a top price of $70 per ton are now being made. The highest price recorded was $66 for choice lots, while the top basis price for 60 per cent. ore was $62.50 and ranged downward to $58. For three weeks now the basis price has advanced $1 each week. Calamine likewise has reached a record price, the basis being $30 to $31 for 40 per cent. ore, with the choicest lots selling for $37. Lead ore was weaker at $59 to $61. On miscellaneous scrap we quote as follows: Light brass, 5.50c.; heavy brass and light copper, 9.50c.; heavy copper and copper wire, 10.50c.; pewter, 21c.; tinfoil, 31c.; zinc, 3.50c.; lead, 3.50c.

The Emerson-Brantingham Company, Rockford, Ill., has filed notice of its intention to increase its capital stock from $6,000,000 to $50,000,000. This increase is coincident with a merger involving the following companies: Emerson-Brantingham Company and Emerson Carriage Company, Rockford; Emerson-Newton Implement Company, Minneapolis; Emerson-Newton Company, Kansas City; Emerson-Brantingham Plow Company, Dallas; Emerson-Brantingham Implement Company, Spokane; Gas Traction Company, Minneapolis; La Crosse Hay Tool Company, Chicago Heights; a company manufacturing threshers; a wagon manufacturing company and a grain drill company, the latter three not being made public as yet.

Iron and Industrial Stocks

NEW YORK, July 24, 1912.

The stock market has maintained its strength remarkably for the midsummer season. Crop reports, which have been unusually excellent, have been a helpful influence in the upward movement in securities. Quite a sensational decline occurred in the price of wheat, as a result of the figures published during the week indicating a bumper crop of spring wheat. The range of prices on active iron and industrial stocks since Wednesday of last week to Tuesday of this week was as follows:

Bald. Loco., com...	56 - 58¼	Pressed Steel, pref.....	101⅛
Bald. Loco., pref...	105⅞-106	Railway Spring, com.....	34⅝
Beth. Steel, com...	35 - 36¼	Railway Spring, pref.....	102⅛
Beth. Steel, pref...	68 - 68½	Republic, com.....	26¾- 27¾
Can, com.....	36 - 37⅛	Republic, pref.....	84¾- 85⅛
Can, pref.....	116¾-117⅜	Pipe, com.....	18⅜
Car & Fdry., com..	57½- 58¾	Pipe, pref.....	58¾- 59
Car & Fdry, pref..	116½- 118	U. S. Steel, com....	69½- 71⅛
Steel Foundries.....	34	U. S. Steel, pref...	111½-112⅜
Colorado Fuel.....	29¾- 31½	Westinghouse Elec..	76¾- 78½
General Electric.....	178 -182	Va. I. C. & Coke...	55 - 57
Gr. N. Ore. Cert....	42 - 43½	Am. Ship, com.....	47 - 50
Int. Harv., com.....	118½-121¾	Am. Ship, pref.....	102
Int. Harv., pref.....	120	Chic. Pneu. Tool....	50 - 50⅜
Int. Pump, com.....	26	Cambria Steel.....	43¼- 44½
Int. Pump, pref....	79½- 80	Lake Sup. Corp.....	32½- 33
Lackawanna St., com.	36 - 37½	Pa. Steel, pref.....	97⅛
Locomotive, com....	41½- 43⅜	Warwick	10¼
Locomotive, pref.....	108¾	Crucible Steel, com.	16 - 17
Nat. En. & St., com.	16 - 16⅛	Crucible Steel, pref.	92 - 93
Pitts. Steel, pref....	102 -102½	Harb. Wk. Ref., pref.	100 -100⅝
Pressed Steel, com..	35¼- 35½		

Dividends Declared

The Cambria Steel Company, regular quarterly, 1¼ per cent., payable August 15.

The International Harvester Company, regular quarterly, 1¾ per cent., on the preferred stock, payable September 3.

The Pope Mfg. Company, regular quarterly, 1½ per cent., on the preferred stock, payable July 31.

The Torrington Company, 4 per cent. on the common stock, payable August 1.

Personal

R. W. Gillespie has been appointed New York sales agent of the Pennsylvania Steel Company, to succeed John C. Jay, Jr., promoted to the position of acting general manager of sales. Mr. Gillespie has been assistant New York sales agent since 1906, and has been connected with the New York selling force for nine years.

J. B. Doan, vice-president and general manager American Tool Works Company, Cincinnati, Ohio, is enjoying a vacation in Maine.

Frank A. Moeschl, sales manager Newport Rolling Mill Company, Newport, Ky., has returned from a vacation trip to the Pacific coast and Canada.

A. J. Berger, formerly purchasing agent and advertising manager of the American Spiral Pipe Works, has resigned to become secretary and treasurer of the Standard Spiral Pipe Company, Chicago.

John T. Dickerson has been appointed sales engineer in charge of Eastern territory for the Strauss Bascule Bridge Company, Chicago, with offices in New York. He was formerly with the Scherzer Rolling Lift Bridge Company.

Benjamin Nicoll, of B. Nicoll & Co., pig iron merchants, New York, sailed for Europe on the Mauretania on Wednesday.

Harry Molden, export representative in Australia of Sargent & Co., New York and New Haven, sailed July 20 from New York on his return to Australia by way of Siberia.

H. B. Kraut, of Joseph T. Ryerson & Son, New York, has returned from Europe after a four months' trip, during which he found trade conditions very good.

Marcellus L. Bailey, treasurer Union Mfg. Company, New Britain, Conn., sailed last week for a few weeks' visit to England and Scotland.

Charles H. Brandt has been elected president of the National Iron & Wire Company, Cleveland, Ohio, to fill the vacancy caused by the death of W. F. Billenstein. James Craig, who was superintendent, succeeds Mr. Brandt as vice-president and also has become general manager. L. C. Schendel continues as secretary and treasurer.

Horace W. Lash, president Garrett-Cromwell Engineering Company, Cleveland, Ohio, has returned to Cleveland from the Pacific coast where he spent several months.

George E. Randles, vice-president Foote-Burt Company, Cleveland, Ohio, returned July 18 from a several weeks' trip to Europe. He visited England, France and Germany in the interest of his company.

F. P. Huston, formerly sales manager of the Kempsmith Milling Machine Company, Milwaukee, Wis., has resigned his connection to accept a similar position with the International Machine Tool Company, Indianapolis, Ind., manufacturer of the Libby turret lathe.

Charles F. Bliss was elected president of the Farrel Foundry & Machine Company, Ansonia, Conn., at the annual meeting of the corporation, July 18. Franklin Farrel, Jr., was elected vice-president; Frank E. Hoadley, secretary, and Alton Farrel, treasurer.

H. B. Van Pelt has been appointed to represent the Columbia Steel & Shafting Company, Pittsburgh, as its Cleveland sales agent. The company has taken over the Cleveland sales office of the Pittsburgh Shafting Company, Detroit, and retained the services of Mr. Van Pelt.

Fred Krebs, general manager of sales of the Cambria Steel Company, Johnstown, Pa., has tendered his resignation, effective August 1. He has been connected with the company more than 40 years, beginning as a clerk and in turn becoming assistant superintendent and superintendent of the Gautier mills. In this latter capacity he also had charge of Gautier department sales, and in 1907 was made general manager of sales.

J. L. Replogle, assistant to president Cambria Steel Company, Johnstown, Pa., has been placed in entire charge of all manufacturing operations, sales, and other affairs of the company during the absence of President Charles S. Price, whose illness is such that several months may be required for his recovery.

Obituary

THOMAS S. PARVIN, long connected with the Philadelphia iron trade, died July 16 at his summer home at Wildwood Manor, Pa., aged 65 years. Born in Bridgeton, N. J., he began business as a partner of Jay Cooke, the famous Philadelphia banker. Later he entered the firm of C. W. & H. W. Middleton, iron merchants, and then assisted in forming the partnership of Lindsay, Parvin & Co. For the past five years he had been in failing health. He leaves a widow and two daughters.

Pittsburgh and Vicinity Business Notes

The Diamond Forging & Mfg. Company, Pittsburgh, whose plant was destroyed by fire last spring, has moved into its new factory, and is now in position to accept orders for drop forgings of all kinds. It has considerably increased its facilities for turning out automobile forgings, and also making gear blanks, pinion shafts, etc., from high grade steel. The company is in the market for one second-hand 2000-lb. board drop hammer, and prefers the Billings & Spencer make.

The steel plate work for two blast furnaces for the Pittsburgh Steel Company at Monessen, Pa., is to be supplied by the W. B. Pollock Company, Youngstown, Ohio, which some time ago secured the contract for the hot stoves.

The Universal Equipment Company, House Building, Pittsburgh, has been appointed district sales agent for the Eclipse specialties made by the Houghson Steam Specialty Company, Chicago.

Work has been started on the new plant of the Automatic Sprinkler Company of America at Youngstown, Ohio. The building will be 235 x 400 ft. in size, of brick and steel construction.

The American Axe & Tool Company has abandoned its plant at Beaver Falls, Pa., and is moving the machinery to its works at Glassport, Pa. About three years ago the plant was visited by fire which resulted in diverting a large number of the employees to the Glassport plant and the Charleston, W. Va., plant, and at any rate since that time the working facilities have been handicapped. The controlling interest in the company was recently acquired by W. C. Kelley, president Kelley Axe Mfg. Company.

The Kinnerdell Silica Sand Company, Pittsburgh, recently organized, has purchased 66 acres of a deposit of open-hearth steel-casting and silica sand at Kinnerdell, Pa., on the Allegheny Valley Railroad. Contracts have been placed for the equipment and plant and the production after August 1, it is expected, will be about 200 tons per day. The officers of the company are: President, L. V. Blue, of the Wheeling Mold & Foundry Company; vice-president and general manager, Horton Penrose, Pittsburgh representative of Shimer & Co., Philadelphia; secretary and treasurer, Thomas R. Hayward, Jr., of Walter-Wallingford & Co. Shimer & Co. are to be the selling agents for the new company.

Another Steel Corporation Investigation

The Interstate Commerce Commission has ordered an investigation which is recognized as being aimed at the United States Steel Corporation It announced last week that it would upon its own motion start an investigation into "the rates, practices, rules and regulations governing the transportation of cement, iron ore, iron and steel and their products, and the materials used and consumed in the mining or production thereof, to all points in the United States east of the Mississippi and north of the Ohio and Potomac rivers, described as official classification territory." The commission says that it has received both formal and informal complaints against these rates, and that it is desirable to start an investigation in order "to keep itself informed as to the manner in which common carriers subject to the act to regulate commerce, as amended, conduct their business."

The scope of the inquiry is outlined as follows:

That said inquiry shall ascertain whether any common carrier subject to the act to regulate commerce, as amended, owns or has any interest in, by means of stock ownership in other corporations or otherwise any of the above-named articles which it, directly or through other companies which it controls or in which it has an interest, transports over its line as a common carrier, or in any manner owns, controls, or has any interest in mines from which iron ore is taken; whether there is common ownership or control of, or interest in, directly or indirectly, by means of stock ownership in other corporations or otherwise, any common carrier and the mining or production of any of the above named articles; and whether persons, firms or corporations having substantial interests in the one, by direct ownership or the holding of stock or securities of common carriers, corporations, mining or producing the articles above named or other corporations, or otherwise, occupy, or are represented by persons occupying positions of control in the other.

The object of the investigation is described as follows:

That said proceeding and inquiry be conducted with a view to the issuance of an order or orders requiring the respondents herein to cease and desist from charging, demanding, collecting or receiving rates and charges for and from enforcing their practices, rules and regulations governing the transportation of said commodities, in so far as the same may be found unlawful and requiring such respondents to establish such rates to said destinations and such rules, practices and regulations relative to the transportation of the same as may be found just and reasonable and not unjustly discriminatory.

The order as issued by the commission names about 250 railroad companies as respondents, comprising many of the leading systems, but it also takes in railroad subsidiaries of the Steel Corporation, such as the Bessemer & Lake Erie, Birmingham Southern, Duluth & Iron Range, Duluth, Missabe & Northern and Elgin, Joliet & Eastern. No date has yet been set for the beginning of hearings.

The David Ranken, Jr., School of Mechanical Trades, St. Louis, completed its third full year last week by graduating 49 students who had taken full courses. The graduates included eight in carpentry, two in painting, two in steam engineering, five in patternmaking, eight in plumbing, one in bricklaying, and 23 as metal trades apprentices. The school, which is endowed sufficiently to enable independent work on a much larger scale, is constructing additional buildings which will be completed in time for the new school year. At present it maintains a waiting list in most of its divisions. The faculty for the coming year will consist of 16 thoroughly qualified teachers. The certificates of graduation state that the holder is a fully equipped mechanic in the line specified and capable of doing all work required of a master at the trade.

The Inland Steel Company's By-Product Coke Plant

The Inland Steel Company, Chicago, has awarded the contract for building a battery of 65 by-product coke ovens to the H. Koppers Company, Chicago. The ovens are to be this company's cross regenerative type and of a size rated to yield 13¼ tons per charge, which compares with 12¾ tons for the ovens at Gary. A coking time of 16 hours is specified, which compares with about 17 hours at the Gary plant and about 18 hours at the Joliet plant. The Koppers direct process for the recovery of ammonium sulphate will be used, and the waste gas will be used as fuel for the reheating furnaces at the steel plant. The ovens will be built near the blast furnaces at Indiana Harbor, Ind., and it is expected will be in operation within a year from September.

Coloring of Patterns for the Foundry.—To encourage the proper coloring of patterns in the foundry, the Treadwell Engineering Company, Easton, Pa., has prepared a card for free distribution showing the coloring of patterns as recommended at a joint meeting of the Steel Founders' Society and the American Society for Testing Materials. Besides the black for core prints, red is used to indicate finished surface and yellow for rough surface. It is the company's endeavor, E. R. Euston, second vice-president, states, to have patterns properly colored "so that our steel foundry is enabled to determine what part of the casting is to be in the rough and what part is to be machined, thereby facilitating not only the molding but permitting to furnish castings that will machine true and clean."

The Imperial Car Company, Hamilton, Ont., Canada, recently incorporated, has changed its name to the National Steel Car Company, Ltd., the change in name being at the request of the State Department at Ottawa. The capital stock of the company is $6,000,000, of which $1,500,000 is 7 per cent. accumulative preferred, and has been completely underwritten. A tract of 50 to 60 acres has been acquired in Hamilton and contracts have been let for the construction of a plant, the main building of which will be 200 x 900 ft. and will have a capacity of 35 to 40 steel and wood freight cars a day. The officers of the company are Sir John Gibson, Lieutenant Governor of Ontario, president; Basil Magor, New York, vice-president and general manager, and Adolph Butze, assistant secretary and treasurer. The directors are Sir John Gibson, William Southam, William Scott, of Hamilton; Sir H. Pellatt, of Toronto; W. G. Ross, Mortimer Davis, C. H. Cahan, of Montreal; William Barclay Parsons, W. Kirkpatrick Brice, Murray H. Coggeshall and Basil Magor, of New York.

Peace for another year in the Pittsburgh coal fields was assured July 22 when a special convention of District 5, United Mine Workers of America, approved, by a two-thirds vote, a new wage scale. The action affects 45,000 men. In addition to an increase of 5 cents a ton the miners obtained concessions regarding working conditions.

The Massey Vise Company has its new plant at 552 West Harrison street, Chicago, fully equipped, including some additional special tools, and is prepared to execute orders promptly for any of its vises for milling, drill press or bench work.

The Standard Spiral Pipe Company, recently organized to manufacture reinforced spiral pipe, has secured plant facilities at West Pullman, Ill., and will install new equipment. The company is now in the market for a 60-lb. Bradley helve hammer, a punch press with angle shear attachment of a capacity to shear 2¼ x 2½ in.; an eye bender and an electric welding machine with a 24-in. throat.

Hickman, Williams & Co., Chicago, have been appointed exclusive sales agents for the Cumberland furnace of the Warner Iron Company, Cumberland, Tenn. The stack is now undergoing repairs but is expected to be in blast by September 1.

The H. Koppers Company, Chicago, has practically closed a contract with the Minnesota Steel Company, Duluth, for the construction of a battery of 92 Koppers by-product coke ovens, but no further details are available.

New Tools and Appliances

This is essentially a news department for which information is invited

Double Hook Bolt.—A bolt which can be passed through a hole having the same diameter as its stem has been brought out by the Kling Bolt Company, 42 Broadway, New York City. This bolt is made with either plain or braced heads and is designed to have as much metal at the smallest part near the head as it has at the root of the thread. The braced head bolt is intended for heavy work and in applying it the braced half of the head is passed through first. In the case of the plain type the heads are passed through the hole simultaneously.

Copying Machine for Photographs.—The Rectigraph Company, Rochester, N. Y., has brought out a simpler form of rectigraph than that described in this column January 18, 1912. This machine in general principle is the same as the other, but it occupies less space and is not so rapid, being designed to supply the demand for a less elaborate machine for copying plans, etc. It will handle books measuring 19 x 28 in. and loose records up to maximum dimensions of 17½ x 12½ in.

Metal Saw.—For cutting off high speed and other hardened tool steels, the Peter Brothers Mfg. Company, Algonquin, Ill., has designed an abrasive metal saw for use in the tool room. The capacity of the machine is bars ⅞ in. square and angles, channels, T's, etc., up to 1¼ in. The cutting wheel, which is 8 in. and 1/16 in. thick, has an adjustable gauge to enable small duplicate work to be turned out rapidly.

Automatic Surface Grinding Machine.—Northampton Emery Wheel Company, Leeds, Mass., has brought out an automatic surface grinding machine in which the base and the column, which is of box section, are cast together. The head, which works in slides in the upper part of the column, carries the abrasive wheel and has both hand and automatic cross feed, the range of the latter being from 1/64 to ⅛ in. per stroke of the table. The table supporting knee has an ample bearing surface on the front of the column and is raised or lowered by a heavy elevating screw which is graduated to read in thousandths of an inch. Although the driving and feeding mechanism is located inside the column, it is readily accessible and the parts are oiled by compression grease cups on the outside of the machine, the lubricant being led to the different bearings through copper piping. The knee, the cross feed and the longitudinal feed, the last two being used when setting work on the table, are controlled by handwheels conveniently located in the front of the machine. The drive is of the planer type and a conveniently located foot lever in front of the base enables the machine to be started and stopped instantly. Three different lengths of table, ranging from 24 to 36 in., are built and all have a common width, 10 in.

Milling Machine for Dies.—The Harrington Machine Company, Erie, Pa., has recently placed on the market a die milling machine in which the spindle is at right angles to the table where the work is attached. The work is fastened to the table with the marked side up so that the lines which the operator is to follow can be readily seen and the clearance is obtained by using angular mills. The table, the work and the cutter can all be tilted to an angle if desired to add to the convenience of the operator and secure the necessary light. The floor space occupied by the machine measures 27 x 25½ in. and the weight is 1250 lb.

Drilling Machine Attachments.—A milling attachment and a compound table intended for use in connection with upright drilling machines ranging from 14 to 42 in. in swing has been brought out by the Hinckley Machine Works, Hinckley, Ill. The attachment has a substantial device for holding the work. All of the bearings are scraped and bronze nuts are furnished for the screws to run in.

Portable Electric Drilling Machine.—Among the recent products of the American Electric Tool Company, West Newton, Mass., is a portable electric drilling machine which is made very light. Ball bearings are provided for the armature shaft of the motor and the gears are of hard steel and Parsons bronze. To prevent wear and friction when the tool is pressed against the material to be drilled a ball-bearing thrust protected by a dust cap is employed. Forced circulation of air keeps the motor cool and a quick break switch in one of the side handles gives instant control. The other handle will unscrew, and as the chuck is off center it is possible to use the machine in close quarters.

Soft Hammer.—Chas. Herzog, 44 Reed place, Detroit, Mich., has brought out a soft hammer in which the handle is of tempered bessemer steel cast in a light special metal grip and head. The material employed for these parts can be cast in any of the soft metals, although a combination of lead and babbitt with the proportions of four to one is recommended by the maker as being best suited for general work.

A New Variety Saw.—For use in pattern, cabinet and other special woodworking shops the Oliver Machinery Company, Grand Rapids, Mich., has brought out a new type of variety saw. This machine carries a blade 12 in. in diameter, with a maximum rise above the table of 3½ in. Material 14 in. wide can be ripped and by using miter gauges cuts 11 in. wide can be taken. The table, which has a special saw guard, tilts to a maximum angle of 45 deg. and a dado head 12 x 1½ in. can also be used. The floor space occupied by the machine measures 39 x 44 in. and the weight is 750 lb.

Sensitive Drilling Machine.—An increase in the number of spindle speeds available is a special feature of the new sensitive drilling machine recently brought out by the Francis Reed Company, Worcester, Mass. In this machine the number of speeds has been increased from three to six, and they are secured by shifting a lever on the top of the column to vary the position of the idler pulley. In this way speeds ranging from 600 to 2400 r.p.m. are available with an initial countershaft speed of 900 r.p.m. The countershaft is detachable and can be used either on the base or connected to an overhead lineshaft.

Electric Muffle Furnace.—The Multiple Unit Electric Company, 136 Liberty street, New York City, has placed on the market an electric muffle furnace having a special controller built directly in the furnace case. This can be furnished with a controller for either 110 or 220 volt direct or alternating current circuits, but cannot be made to operate on both of them. Temperatures from 200 to 1800 deg. F. can be secured and if desired a medium temperature can also be maintained indefinitely.

Adjustable Boring Tool.—R. M. Clough, Tolland, Conn., has brought out an adjustable boring tool which is designed to size holes either to standard dimensions or 1/64 in. under, leaving a cut for a finishing reamer. The blades are put in dovetail slots and are set at an angle and the holder is so made as to clamp the blades with a square end wrench.

Bench Grinding Machine.—The American Electric Tool Company, West Newton, Mass., has developed a type of grinding machine for use on a bench, in which the base is made heavy enough to steady the machine and at the same time extends sufficiently to act as a guard for the motor. A U-shaped tool rest which is adjusted toward and away from the wheel on the base by a bolt fits around the two sides and the face of the wheel. The control switch which is of the hand snap type is at the opposite end of the base and the space between is used for a depressed water pot. The bearings are of hardened bronze and are adjustable to take up wear.

Plain Radial Drilling Machine.—The Cincinnati-Bickford Tool Company, Cincinnati, Ohio., has recently brought out a new design of plain radial drilling machine with arms ranging in length from 4 to 6 ft. Among the special features of the machine are rigid construction, the complete inclosing of the gearing and the convenient location of the operating handles. The drive may be a cone pulley drive, speed box drive, an adjustable-speed motor drive or a motor and speed box drive. The first type gives 15 changes of speed, which the number secured from the

adjustable-speed motor drive is practically unlimited. The speeds are in geometrical progression and are arranged to drive a ¾-in. drill at rates of 58, 61 and 63 ft. per minute for the three sizes of arms. Five rates of feed are available ranging from 0.006 to 0.024 in. per revolution of the spindle, each rate being obtainable by setting a pointer to the desired position.

Heavy Horizontal Boring, Drilling and Milling Machine.—The Detrick & Harvey Machine Company, Baltimore, Md., has recently built a heavy boring, drilling and milling machine of the horizontal type. This machine consists of a box-shaped runway upon which the column is mounted and the base of the column has a sliding fit on the runway throughout its traverse of 168 in. The saddle, which is guided by a narrow track, has a bearing 50 in. long on the face column and a vertical movement of 12 ft. The spindle has a stroke of 60 in. and the nose is reamed for a No. 7 Morse taper. The power for operating the machine is furnished by two motors. One of these, a 7½-hp., constant-speed reversible motor located on the end of the runway furnishes the power for traversing the column on the runway and the saddle on the column. The other motor, which is located on the platform, is used to provide the spindle speeds, which range from 1 to 60 r.p.m. This motor has a speed variation of 1 to 3 and its capacity is 20 hp. Both of these motors are controlled from the operator's platform and the levers for the feed and the drive gearing are interlocking so that no two conflicting movements can be engaged at the same time. Eight feeds to the saddle, columns and the spindle ranging from 0.01 to 0.05 in. per revolution of the spindle in either direction are available and all movements of the spindle, saddle and column are obtainable either by hand or power.

Lock Washers.—A simple device which is claimed to prevent a nut from jarring off a bolt has recently been brought out by the Steel Specialties Company, Boston, Mass., and is known as the Worth wedge washers. The device is in the form of a washer with a scalloped inner edge, the projections of which point outward before the washer is applied to the bolt. After the washer is placed over the bolt a punch or larger size nut is used to straighten or flatten it with the result that the prongs wedge tightly between the threads of the bolt and the body of the nut. The nut can be removed with a wrench, but will not jar off and if it is desired to remove the washer this can be easily done by severing one side with a chisel. The use of this washer is said not to affect the thread in any way.

Test Indicator.—The Alvan Mfg. Company, Newark, N. J., has recently brought out a universal test indicator having hardened cone pivot bearings which are kept in constant uniform adjustment by spring thrusts that prevent lost motion and consequent errors in reading. It is claimed for these bearings that no adjustment is required as they make the indicator very sensitive. In use the indicator is attached to the tool post holder by a universal joint which is kept in the desired position by friction. The use of this joint enables the indicator to be set at any angle with relation to the shank and either side of the contact point can be used. The spring tension is reversed by moving a button on the end of the barrel one-half turn. The ratio in which this indicator multiplies the error is 50 to 1 and its maximum capacity is 0.02 in.

Die Head.—The Pottstown Machine Company, Pottstown, Pa., has recently installed a new die head in which the body is made of machinery steel and is internally slotted at an angle to conform to the Briggs standard pipe taper. The chasers can be put in any of the slots in the body and are kept in position by an alignment cam which engages with their teeth. This cam has four cam surfaces, one for each of the chasers, and when turned by a wrench the chasers are securely clamped in their respective slots in the body. As the points of the chasers become dulled by use, the ends are ground off and they are moved forward. Several sizes of head, ranging from 1 to 6 in., are made.

Attachments for Bench Lathes.—The Elgin Tool Works, Elgin, Ill., has recently designed and built six attachments to extend the usefulness of the bench lathe as a manufacturing tool. These attachments include one for filing, two for milling and cylindrical and surface grinding attachments. The filing attachment consists of a substantial base fitting the bed of the lathe and carrying two vertical rods with horizontal arms between which the file is placed. Motion is transmitted from the lathe spindle through a crank connection to give the rods a reciprocating vertical motion. The circular work table which forms a part of the fixture is arranged so that it can be tilted at right angles when filing the clearance in a die. The two milling attachments are mounted on the slide of the lathe and are driven from the overhead countershaft by round belts. In one of these attachments the spindle is horizontal and in the other it is vertical. The horizontal attachment can be adjusted for hight, while the vertical spindle can be swung to any desired angle. The cylindrical grinding attachment can be set to accommodate either internal or taper work and is driven from an overhead countershaft in the regular way. The surface grinding attachment is made in two forms, although in the essentials they are the same. In one the work is adjusted for hight, while in the other the spindle is adjustable.

Die Sinking Machine.—A recent product of the Welling-Northrup Company, Jackson, Mich., is a die sinking machine for working out drop forging dies at a single setting. The usual vertical spindle is carried on this machine in a bracket hinged to the main frame and in addition there is a device for cherrying. This consists of a rocking arm which carries a cherry at its end that is set so that it will oscillate into the die block. The cherry can be raised on each non-cutting stroke and provision is also made for a limited amount of automatic side movement without shifting the table. A jet of air to keep the work free from chips is supplied to the cutting tool by an air pump. Six changes of speed are provided giving a sufficient range for all requirements. The weight of the machine is approximately 4300 lb.

Triangle.—A type of triangle which is designed to enable the draftsman to proceed with the work of making line drawings or tracings without waiting for the lines already drawn to dry, has been brought out by the Loxograph Instrument Company, Wilmington, Del. Its design is based on the fact that a knife edge wheel of the proper proportions will run over an ordinary ink line without blurring it and it has wheels of this type. An additional precaution against blurring the lines is provided by these wheels which keep the ruling edges out of contact with the paper. In this way, it is pointed out that they will not blur the lines when the instrument is being moved over them and they also will not smear the drawing if the ink in the drawing pen wets the ruling edges. These rollers permit the instrument to be moved about easily on the board in putting in small detail work and also to act as a hand rest. The triangle is held steady by pressing it against the paper.

Adjustable Screw Cutting Die.—Edgar T. Ward & Sons, Boston, Mass., have recently placed on the market a new type of adjustable screw cutting die which is known as the Remington. This is constructed in two parts with an integral heavy rigid hinge on one side. The cutting surface is ground after tempering and sufficient clearance space is provided to enable the die to be sharpened with an emery wheel or a diamond powder lap. The taper hole at the top of the die enables the tapered point of the adjusting screw in the die holder to be inserted and adjustment for expanding or contracting the die is thus accomplished without removing it from the holder.

Punch Press Safeguard.—The punch press safeguard made by the H. & A. Lock Company, Brooklyn, N. Y., has been improved so that the guard is operated at each revolution of the crank regardless of whether the treadle is pressed or not. In the original guard the operation was by the foot treadle alone and it was timed so as to rise prior to the tripping of the press. In the improved form an additional set of levers are used to secure the continuous operation of the guard and any accident to the treadle or clutch will not prevent the raising of it.

Great Northern Ore Developments

BY AN OCCASIONAL CONTRIBUTOR

Plans of the Great Northern Ore Properties (Mesaba range), as now outlined, include the stripping of three iron-bearing tracts and the bringing of these into the producing class as rapidly as is convenient. The more important of these tracts is the southwest one-fourth of section 27-58-20. This lies directly east of the Monroe, a large stripped property of the United States Steel Corporation, and south of two small tracts of Great Northern properties, one of which is held by that interest under a 50 per cent. fee interest and the other under a 25 per cent. fee. The Monroe is stripped to the line of section 27, and a slight amount of overburden has been removed from the latter in the course of the development of the former; to that extent the Great Northern will profit by the development of the adjoining property of the Steel Corporation.

The stripping contract under which this section 27 property is to be stripped has been let to the firm of Winston Bros. & Dear, and comprises a total of some 5,000,000 yd., which will not be sufficient to uncover the entire ore body, and 3,000,000 or 4,000,000 yd. additional will be let later. The overburden is very thick, probably not far from 100 ft. on the average. Stripping operations are already in progress and are expected to continue uninterruptedly. Roughly speaking, there will be exposed 1 2-3 tons of ore for each ton of overburden removed from this property. The ore of this property is of reasonable grade, but is not such as was looked on with favor a few years ago. The property is owned in fee, not by the Great Northern, but by the estate of J. S. Pillsbury of Minneapolis, Minn., and associates, who, in this case, are R. M. Bennett of Minneapolis and J. M. Longyear of Brookline, Mass. The owners leased this property, April 1, 1902, to Duluth parties, who subsequently assigned their interest to the Great Northern, receiving therefor a considerable bonus and a 5-cent additional royalty. There is an underlying royalty of 25 cents a ton to the fee owners, with a minimum annual output of 100,000 tons. Of course this minimum will be greatly exceeded by the time the Great Northern commences mining, but there will then have accumulated advance payments on a gross tonnage amounting to 1,250,000 tons, at the total rate of 30 cents a ton.

Another tract for the stripping of which contracts will be let in a few days comprises the south half of the north half of section 15-58-19, adjoining the Woodbridge mine. This also contains a large quantity of ore, and the amount of stripping to be done here is considerably less than that on the first mentioned piece. A portion of this land is the property of an individual who would have received the entire amount of the royalties under the Great Northern lease with the Steel Corporation, and will take the profits of operation under the new plan of procedure by the Great Northern. The remainder is held in fee by the public school fund of the State of Minnesota, and the State will receive a royalty of 25 cents a ton on this ore. The stripping here is not so deep as on section 27-58-20, before referred to.

A third tract to be contracted for development at this time is a tract of State land south of and adjoining the Mahoning and west of the Rust, the southwest quarter of the northwest quarter of section 2-57-21. This also pays an underlying royalty of 25 cents a ton to the State school funds. The amount of stripping here is comparatively small and the tonnage to be developed is slight, but of excellent grade. So far as is generally known, there are no other tracts to be opened at once by the Great Northern. At the time of the withdrawal of the Steel Corporation from its Great Northern lease there will be several mines that it has opened on the lands of the latter company, which will be in condition to furnish a large tonnage at once, for it is impossible for the Oliver Iron Mining Company prior to the expiration of its lease to exhaust all the mines that it has opened on Great Northern lands.

The Great Northern has organized a mining department, under D. M. Philbin of Duluth, with Earl E. Hunner in charge as chief mining engineer, and with offices at Duluth and on the Mesaba range. This organization will be enlarged as time passes and the necessity arises. Contracts let and under consideration will call for the expenditure of about $3,000,000.

It is interesting to note that none of the land to be developed immediately is held in fee by the Great Northern, and that all of it is controlled under royalties of 25 cents a ton, with the exception of one 40-acre tract, the entire income from which is understood to go to other hands. It is Mr. Hill's hope that by the Great Northern opening these lands itself and making the entire profit therefrom, the Great Northern certificates will derive as great an income as would have been the case were the lands to remain in the possession of the Steel Corporation. The Steel Corporation's royalties on these lands, in 1915, would amount to $1.122 per ton of 59 per cent. ore, assayed dried. In addition to that the Steel Corporation was bound, under the terms of the lease, to add to the royalty rate the equivalent of any sum that might intervene between the former freight rate of 80 cents a ton and the rate current at the time of shipment. This provision would raise the royalty by 20 cents a ton to-day, freights having been reduced from 80 cents a ton to 60, with the likelihood of a further raise of at least 10 cents by 1915, if freight rates are again reduced. So the Steel Corporation's royalty in 1915 would probably be $1.422 a ton. By taking the entire profit above the underlying royalty, Mr. Hill expects that the holders of certificates will derive their looked-for income, which he feels they have the right to expect. The appreciation of 3.4 cents a year in the Steel Corporation lease will require a mining profit increasing each year by that amount, until the exhaustion of these ore bodies, in order to return the expected incomes to these certificates. Were the Mesaba range the only available iron ore field, or had discoveries of excellent iron ore ceased permanently, there could be little doubt as to the strength of such reasoning.

General Utility of Motor Trucks

BY H. S. DANIELS*

The exact advantage of the motor truck over horses in any particular case is not a question that can be easily determined from the experience of others. This is so for the reason that no two business organizations have to meet precisely or even approximately the same haulage problems. Facilities for loading, length of hauls, number of stops, daily tonnage carried, nature of the streets and highways traversed, climatic conditions—all these are questions which go directly to the economical phase of the proposition.

Firms engaged in a certain business find that investigation of motor haulage in their own line leaves them stranded in further doubt. They learn that where certain conditions may be materially like theirs, there are special elements in each case to which it is difficult to find a parallel.

In the files of the Kissel Motor Car Company are experience letters from users of KisselKar trucks in 75 or more lines of trade. That each individual experience is different is the most marked impression that these letters leave.

Statistics, comparative data, mazes of figures that illustrate when analyzed nothing more than individual cases have been published in truck discussions, and it is not surprising that one bewildered truck prospect writes, "Tell me how your truck has met the haulage question that might arise in any business. That is the point I want to settle in my mind first."

The experience of Alexander H. Revell & Co, Chicago, during the excessive blizzard of February 26, 1912, a day when horses were unable to travel to any extent, was an experience that would have come to any owner of as good a truck service. Revell & Co. used four trucks on that day, covering a total of 124 miles and making 95 deliveries.

Last March during a week of incessant rain, with roads in such a condition as to almost preclude horse haulage, the New Jersey Flour Company, Passaic, N. J., operated a four-ton truck 290 miles, all in country traffic, delivering 984 barrels of flour.

The Weideman Brewing Company, New Haven, Conn.,

*Kissel Motor Car Company, Hartford, Conn.

reports a similar experience, mentioning specifically a trip from New Haven to Bridgeport, a distance of 36 miles, when the mud was so deep that the truck sank in nearly to the sprockets, yet went through without any mechanical trouble whatever. The truck carried a full 4-ton load.

The Plumb & Nelson Company, Manitowoc, Wis., states that it was able through the use of a motor truck to fill a big emergency telegraph order, which had to make a certain train, whereas with horses there would have been insufficient time.

The Kansas City Transfer Company, Kansas City, Mo., hitched a 3-ton truck to a trailer on which was a 37,000 lb. boiler, and a haul of 1¼ mile of this huge bulk was made in 40 minutes. Some time previously it was taken 12 horses 10 hr. to do this identical thing.

One owner engaged in a business that does not involve much delivering writes that he is able to make a profit by undertaking the drayage of neighboring merchants similarly situated. That motor trucks under nearly all normal circumstances are less expensive to operate and care for than horses is a fact made stronger by investigating the exceptional instances where they do not seem to be so.

The study of the motor truck from the standpoint of economy, or actual money saving, should be supplemented by a thorough consideration of its value from the standpoint of service and advertising. A. E. Holmes, superintendent of the Revell store in Chicago, says: "In our business we must be up to date and our customers demand the best we can give them, both in goods and in service. Even if motor trucks were more expensive, which they are not, we would never go back to horses."

Judicial Decisions of Interest to Manufacturers

ABSTRACTED BY A. L. H. STREET

LIABILITY FOR INJURY CAUSED BY UNGUARDED COGWHEELS.—A manufacturer is liable for injury to an employee caused by his feet slipping from a piece of iron into unguarded cogwheels below, on unexpected movement of the machinery; he having stepped on the piece of iron while the cogwheels were not in motion, to adjust machinery. (Indiana Supreme Court, King vs. Inland Steel Company, 96 Northeastern Reporter, 337.)

EMPLOYER'S LIABILITY FOR INJURY TO INEXPERIENCED MACHINIST'S HELPER.—An employer may be held liable to an inexperienced machinist's helper for injury caused by following the machinist's direction to strike a file with a hammer, in attempting to dislodge an embedded block of wood. (Minnesota Supreme Court, Nordberg vs. Hall, 133 Northwestern Reporter, 168.)

RISK NOT ASSUMED BY WORKMAN.—A workman injured at a machine at which he worked only ten minutes did not assume the risk of injury through a condition not observed by him. (New York Supreme Court, Second Appellate Division, Lazarus vs. Eister, 135 New York Supplement 211.)

PROOF REQUIRED IN PERSONAL INJURY CASES.—The New York employers' liability act does not dispense with the necessity of an employee, in suing for personal injury, establishing his freedom from negligence contributory to the accident. (New York Supreme Court, Onondaga County, Pulis vs. Stewart, 135 New York Supplement 155.)

RIGHTS ON BREACH OF WARRANTY OF MACHINERY.—A buyer of machinery, on finding that it does not comply with the warranty on which it was sold, must notify the seller promptly, so that the latter will have opportunity to supply other machinery. Acceptance and long use of machinery known by the purchaser to be defective waive the warranty. (Kentucky Court of Appeals, Forsythe vs. Russell Company, 146 Southwestern Reporter 1103.)

BUYER'S RIGHT TO REVOKE ORDER.—An order for goods given a traveling salesman is revocable by the purchaser any time before its acceptance, where the order is taken subject to approval by the salesman's concern. (Kentucky Court of Appeals, Ryan vs. American Steel & Wire Company, 146 Southwestern Reporter 1099.)

ACQUIESCENCE IN BUYER'S RESCISSION.—By stopping machinery in transit on advice that the buyer repudiated his contract to purchase, the seller acquiesces in a rescission of the contract, and precludes himself from suing for the agreed price. (Arizona Supreme Court, Boyd vs. Second Hand Supply Company, 123 Pacific Reporter 619.)

NECESSITY FOR TENDERING GOODS UNDER SALE CONTRACT.—Before suing for the purchase price of goods, after attempted cancellation of the order, the seller need not tender delivery if the buyer has examined the goods at the seller's place of business and has rejected them as not complying with the contract. (New York Supreme Court, Appellate Term, Mills vs. Knickerbocker Hat Company, 135 New York Supplement 5.)

SUITS AGAINST LABOR UNIONS AND EMPLOYERS' ASSOCIATIONS.—A law prohibiting suits against labor unions or employers' associations for wrongful acts committed by them is unconstitutional. (Massachusetts Supreme Judicial Court, in re opinion of Justices, 98 Northeastern Reporter 337.)

EMPLOYEE INJURED BY BREAKING BELT.—An employer is responsible for injury to a workman caused by the breaking of a pulley belt, negligently repaired by another employee. (Wisconsin Supreme Court, Brossard vs. Morgan Company, 136 Northwestern Reporter 181.)

CONSIGNEE'S RIGHT TO NOTICE OF ARRIVAL OF FREIGHT.—A carrier of freight is bound to notify the consignee of a shipment of its arrival. (Arkansas Supreme Court, Kansas City Southern Railway Company vs. Morrison, 146 Southwestern Reporter 853.)

LOSS OF RIGHT TO SUE FOR PATENT INFRINGEMENT.—Thirteen years' delay in suing to enjoin infringement of a patent, though the device claimed to constitute the infringement has been advertised generously, bars right to enjoin further infringement. (United States District Court, District of Massachusetts, Brown & Sharp Mfg. Company vs. Coates Clipper Mfg. Company, 195 Federal Reporter 84.)

DAMAGES RECOVERABLE FOR BREACH OF SALES CONTRACT.—A buyer on rejecting machinery as not being suited for the purpose for which it was sold, can recover all the damages sustained by him through the seller's breach of contract, including freight paid on machinery and a reasonable sum for storing and caring for it until directed by the seller not to do so. (Mississippi Supreme Court, Ash vs. International Harvester Company, 58 Southern Reporter 529.)

RIGHT TO ENJOIN BREACH OF CONTRACT.—An insolvent salesman and local manager, who has broken his employment contract, can be enjoined from delivering to a rival concern orders taken for his employer and from attempting to induce other employees to break their contracts and enter the service of the rival concern. (Georgia Supreme Court, Kinney vs. Scarborough Company, 74 Southeastern Reporter 772.)

DAMAGES FOR BREACH OF CONTRACT.—The rule of law which requires the injured party under a breach of a contract to minimize his consequent damages so far as he can does not require a contract buyer of copper, under an agreement by the seller to deliver at Houghton, Mich., for transportation to Buffalo, to accept an offer by the seller to deliver at Milwaukee docks and equalize the difference between the freight charges to Buffalo from Houghton and from Milwaukee. (Wisconsin Supreme Court, Pope Metals Company vs. Sadek, 135 Northwestern Reporter 850.)

POWER OF MAJORITY STOCKHOLDERS.—That one owns a majority of the stock of a corporation does not empower him to release a claim held by the corporation to the prejudice of corporate creditors. (United States District Court, District of New York, Pennsylvania Steel Company vs. New York City Railway Company, 194 Federal Reporter 543.)

CORPORATE DIVIDENDS.—If the by-laws of a New Jersey corporation empower the directors to determine the amount to be reserved for working capital, it is permissible to follow a plan whereby stable dividends are secured by making the earnings of prosperous years offset deficiencies in other years. (New Jersey Court of Errors and Appeals, Murray vs. Beattie Manufacturing Company, 82 Atlantic Reporter 1038.)

RIGHTS UNDER LICENSE FROM PATENTEE.—A manufacturer of a patent saw swage under a contract with the patentee and under the trade names "White," "New White" and "Improved White" (the patentee's name being White) is entitled to enjoin him from manufacturing and selling a saw swage under another patent, under any name including the word "White," especially where it appears that the public is being deceived as to the identity of the competing brands. Mr. White may, however, use his own name in his business, either separately or as part of the name of a firm or corporation, and may advertise the fact that he is the inventor of the swage which he is selling. (Wisconsin Supreme Court, Phœnix Manufacturing Company vs. White, 135 Northwestern Reporter 891.)

Trade Publications

Pipe Joints.—National Tube Company, Pittsburgh, Pa. Pamphlet. Describes and illustrates the Matheson joint pipe that is a bell and spigot joint very similar in appearance to a cast-iron pipe joint which is applied to wrought pipe. Its field is in mines and mining, water-works, hydroelectric plants, compressed air and gas transmission lines, engineering work and in general wherever a lead joint is suitable.

Crusher and Pulverizer Parts.—Taylor Iron & Steel Company, High Bridge, N. J. Bulletin No. 114. Pertains to the line of Tisco manganese steel crusher and pulverizer parts which can be furnished for various standard machines.

Power Pumping.—Goulds Mfg. Company, Seneca Falls, N. Y. Bulletin No. 112. Gives handy data on power pumping which includes directions for installing and operating power pumps, the rate of power consumption and discharge of the pumps, pump capacities, dimensions of standard wrought-iron pipe; power transmitted by pulleys, gears and shafting, tables of the pressure of water at different heads, the friction of water in pipes and the discharge from various nozzles.

Fuel Calorimeters.—Precision Instrument Company, 49 West Larned street, Detroit, Mich. Catalogue. Contains information about the standard apparatus supplied by this company for analyzing and estimating the heat value of solid fuels. A brief description of the calorimeter is given together with instructions for making a complete test of the fuel.

Motor Section Cars and Pneumatic Tools.—Chicago Pneumatic Tool Company, Chicago, Ill. Circular No. 108 and booklet No. 111. The former shows the various types of Rockford motor section cars, which are designed for handling all classes of railroad section work. The booklet gives a general idea of the Duntley line of portable electric drilling and grinding machines and electric hoists. These can be used interchangeably on either direct or alternating current circuits and the drills have a capacity of from 3/16 to 2 in. in metal. The grinding machines are of the portable and tool post types and the hoists are built in four sizes ranging in capacity from 250 to 2000 lb.

Gate Valves.—Giant Valve & Mfg. Company, Oakland, Cal. Pamphlet No. 1. Describes a new type of gate valves in which a wedging device is employed to transmit powerful leverage to the wings or disks covering the ports so that it is possible to operate this valve easily.

Water Filtration.—James Beggs & Co., 36 Warren street, New York City. Fourth edition of catalogue No. F-42. Deals with the removal of organic matter, oil, grease and other floating particles from boiler feed water and illustrates and describes numerous installations of the Blackburn-Smith feed water filter and grease extractor.

Steam Pumps.—Blakeslee Mfg. Company, Du Quoin, Ill. Catalogue. Concerned with a new type of single pump which is said to possess the advantages of simplicity, durability and absence of valve gear.

Electrical Supplies.—W. N. Matthews & Bro., St. Louis, Mo. Loose-leaf catalogue No. 8. Lists a very complete line of electrical supplies which include guy clamps and anchor, cable splicing joints, fused switches, lamp guards, etc.

Oxy-Acetylene Welding and Cutting.—International Oxygen Company, 115 Broadway, New York City. Several bulletins. Deal with the various oxy-acetylene appliances made by this company which include welding torches, acetylene generators and an outfit for melting platinum.

Lathes.—Gisholt Machine Company, Madison, Wis. Loose-leaf circular. Calls attention to a record recently made in a railroad shop where the 24-in. motor-driven lathe bored 25 9-in eccentrics in 10 hr. On the opposite page of the circular the process of finishing a knuckle joint is shown.

Internal Combustion Engine.—Charter Gas Engine Company, Sterling, Ill. Folder. Refers to the type R Charter internal combustion engine which uses gasoline, illuminating or natural gas, naphtha, kerosene, fuel oils or alcohol as fuel. These engines are built in various sizes from 7 to 100 hp., those below 20 hp. being of the portable type.

Roller Bearings.—Hyatt Roller Bearing Company, Newark, N. J. Brochure. Size, 9 x 12 in.; pages, 52. Devoted to the plant in which the Hyatt roller bearings are made and consists for the most part of large halftone views, supplemented by text descriptions.

Metal Paints.—Estate of J. G. Hetzel, 67 Maine street, Newark, N. J. Folder. Concerned with a line of paints for tin and metal roofs, gas and ammonia tanks, iron fire escapes, gutters, leaders and all kinds of metal work.

Feed Water Regulator.—McDonough Regulator Company, Detroit, Mich., Cawley Supply Company, House Building, Pittsburgh, Pa., sales agent. Circular. Shows a feed water regulator and other boiler room supplies. These include a pump governor, feed valve, damper regulator, and steam recording gauge.

Tanks.—Wm. B. Scaife & Sons Company, Pittsburgh, Pa. No. 12 tank catalogue. Covers riveted, brazed and welded tanks, including air and gas receivers, water and oil storage tanks, hot water boilers, steel barrels, expansion tanks, gasoline storage tanks. It contains useful tables and considerable data connected with the construction of steel tanks and cylinders.

Electric Welding Machines.—Geuder, Paeschke & Frey Company, Milwaukee, Wis. Pamphlet. Points out the advantages of using spot and butt electric welding machines over riveting and other methods for joining two pieces of sheet metal, rod, angle or tubing. The line of welding machines built by this company is illustrated and briefly described.

Tube Expander.—J. Faessler Mfg. Company, Moberly, Mo. Bulletin No. 28. Illustrates and describes a new sectional tube expander with quick-acting knockout which eliminates side blows on the removal of the mandrel and danger of accident and effects a marked saving in time.

Reamers.—Kelly Reamer Company, 1547 Columbus Road, Cleveland, Ohio. Pamphlet. Lists a line of reamers which are made in various sizes and styles. Directions for the operation and care of these tools are given and mention is also made of a line of boring bars.

Machinists' Tools and Supplies.—Samuel Harris & Co., 114 North Clinton street, Chicago, Ill. Booklet. Contains illustrations and brief descriptions of a large and varied line of machinists' and manufacturers' supplies and tools. Several tables of useful information are included and a complete index renders the finding of any article a comparatively easy matter.

Metal Working Machinery.—Prentice Bros. Company, Worcester, Mass. Collection of loose leaf circulars. Illustrate and briefly describe the various lines of metal working machinery built by this company, together with the different appliances used in connection therewith.

Metal Working Machines.—Rock River Machine Company, Janesville, Wis. Catalogue E. Size, 6 x 9 in.; pages, 97. A profusely illustrated catalogue concerning machine tools known as the Badger line for working bars, sheets and structural shapes.

Hydraulic Turbines.—Allis-Chalmers Company, Milwaukee, Wis. Bulletin No. 1826. Pages, 8. Devoted to hydraulic turbines of the single-stage vertical open flume type and to the gearing and harness work.

Electric Rectifiers.—Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa. Circular No. 1155. Size, 7 x 10 in.; pages, 28. Devoted to an illustrated description of a series of arc lighting systems with the Westinghouse-Cooper Hewitt rectifier which makes available the advantages of both the direct-current series arc lamp and the alternating-current system.

Electric Locomotives.—Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa. Circular No. 1516. Size, 7 x 10 in.; pages, 64. Contains descriptive matter and illustrations and a great deal of general information concerning the Baldwin-Westinghouse electric locomotives and their adaptation by railroads.

Air-Driven Coal Cutters.—Ingersoll-Rand Company, 11 Broadway, New York City. Bulletin No. 5003. Size, 6 x 9 in.; pages, 20. Descriptive of Radialaxe air-driven coal cutters which are especially adapted for undercutting in a pitching seam, shearing in seams and other operations. There are shown the various styles of mountings required for various lines of work and illustrations of the machine at work underground.

Light Commercial Automobile.—Chicago Pneumatic Tool Company, Fisher Building, Chicago, Ill. Booklet No. 115. Size, 4 x 7 in.; pages, 24. Gives a description of the Little Giant commercial car for use where a heavy auto truck is not needed. This is presented in novel fashion by describing what is termed the bones, muscles, digestion, heart, etc., of the machine.

Hydraulic Benders.—Watson-Stillman Company, 190 Fulton street, New York City. Catalogue 83. Size, 6 x 9 in.; pages, 64. Devoted exclusively to hydraulic benders used for bending all kinds of rails, structural shapes, reinforcing rods and pipe; for shaping automobile frames; for straightening rods or shafts while held between lathe centers, and in almost every other conceivable place where heavy bending is to be done.

Jigging and Tooling.—Rockford Drilling Machine Company, Rockford, Ill. A 31-page booklet, size, 6 x 9 in., which describes the Rockford gang drilling machines and illustrates operations in drilling, tapping, reaming and counterboring, facing, etc.

Wire Glass.—Pennsylvania Glass Company, Pennsylvania Building, Philadelphia, Pa. Booklet. Sets forth the merits of wire glass made by the company, particularly of the cobweb wire glass which is new in patterns and said to be distinctive in quality.

Centrifugal Pumps.—Goulds Mfg. Company, Seneca Falls, N. Y. Bulletin No. 110. Size, 8 x 10 in.; pages, 16. Concerned with Goulds single-stage double-suction centrifugal pumps, which are illustrated and explained in detail, together with data in tabular form relating to pump operations.

Power Presses.—Rockford Iron Works, Rockford, Ill. Six-page folder containing two large halftones. Gives data concerning the Rockford inclinable open back foot press and the Rockford flywheel press.

Automatic Sprinklers.—General Fire Extinguisher Company, 1 Liberty street, New York City. Bulletin No. 69. Tells of several demonstrations of the efficiency of the Grinnell sprinklers, of recent installations of the Grinnell system and gives other interesting data on fire prevention.

The Machinery Markets

Excellent reports are received from the greater part of the machinery trade as to the state of the industry. Hot weather and vacations seem to have had a minimum effect on business and the trade as a rule is well pleased. A feature is the greater activity in buying on the part of the railroads, particularly in the South and the West. In addition inquiries from other sources are everywhere more numerous and promising. The New York trade has done some good business and has more before it. In Chicago the railroads are a strong factor in the market, supplementing other good inquiries and lists given elsewhere aggregate 54 items. A steady though not a rushing trade prevails in New England. Philadelphia is fairly active with a good volume of small orders. Present conditions are considered good in Cleveland both as to orders and inquiries. In Cincinnati the foreign trade continues to hold up well and the month has so far been satisfactory, with further business impending. Detroit activity has slackened, although the outlook is excellent. St. Louis has been quiet in the last week, but not altogether unsatisfactory. The Central South has been quiet also, although woodworking machinery is active and the general outlook is good. Inquiries are increasing in Birmingham, with the demand at present greatest for steam-power units. On the Pacific coast the feature of the trade is the call for small pumping apparatus, and while some business in traveling cranes has been reported general conditions are dull.

New York

NEW YORK, July 24, 1912.

New York machinery dealers, like those in other parts of the country, are greatly interested and to some extent concerned with the increasing buying by railroads, particularly those of the Southeastern States which some of the machine tool houses cover from New York. The Chesapeake & Ohio list now before the trade, and which was referred to a week ago, is of a miscellaneous character, including some boiler shop tools. In fact most of the railroad specifications are of this kind, evidently being inspired by a desire or necessity to "fill in" rather than to extend old shops or equip new ones. In a few days the Baltimore & Ohio Railroad is expected to put out a rather extensive list of machines required for its Montclair shops at Baltimore, Md. The Southern Railway has sent a few inquiries to the trade and more are expected from this source. Though their salesmen do not "work" the West or New England as a rule, the New York houses view with satisfaction the increased activity in those directions. Reports received by New York offices from factories in a number of cases reveal most satisfactory activity, the demand having been so great for certain of the standard sizes of machines that stocks have been exhausted and future deliveries are stipulated where orders are received. There has been some excellent buying and more orders are yet to be placed with New York houses by the King Sewing Machine Company of Buffalo, N. Y. Orders placed last week ran into many thousands of dollars, estimates placing the amount expended at between $30,000 and $50,000. The Edwards Motor Car Company, New York, which manufactures the Edwards car and Longest motor trucks, has sent to the trade the following list:

One No. 3 milling machine (Cincinnati).
One 16-in. crank shaper.
One 18-in. lathe and one 14-in. lathe, both equipped with compound rest and taper attachment.
One 8-in. speed lathe.
One 18-in. drill.
Two sensitive drills with stand.
One double end emery wheel stand.
One No. 2 Browne & Sharpe grinder.

The heads of the Edwards Motor Car Company, C. G. Stoddard and H. J. Edwards, according to recent announcement, are to be the managers of the Simms Magneto plant, Plainfield, N. J., when it resumes operations. They have offices in the United States Rubber Company's building at Fifty-eighth street and Broadway, and according to report will equip a factory in the East.

A good buyer of recent date of New York houses has been the Newport News Drydock & Shipbuilding Company, Newport, News, Va., the amount expended being approximately $20,000 for something like 17 tools.

As to general conditions in the New York market, houses which handle extensive lines say that July business has already assumed such proportions as to exceed June, while if the activity keeps on the trade volume of April will be exceeded. Dealers whose lines are restricted say on the other hand that the present month has so far been rather dull, although inquiries are numerous and the prospects good.

The consolidation is announced of the Griscom-Spencer Company, 90 West street, New York, and the Russell Engine Company, Massillon, Ohio, under the name of the Griscom-Russell Company, with a capital stock of $2,000,000. The plant of the Griscom-Spencer Company at Jersey City makes feedwater heaters, evaporators, condensers and other steam power appliances and the Massillon plant makes steam engines. The Jersey City plant will be removed to Massillon. C. A. Griscom, Jr., of New York, will be president of the new company and Arvine Wales, Massillon, vice-president. G. M. Russell will be one of the directors.

The Rubber & Celluloid Harness Trimming Company, Newark, N. J., has had plans prepared for a one-story factory building, 22 x 68 ft., to be added to its plant at Hamburg place and Frankford street. Frederick A. Phelps is the architect.

The Smith-Lee Company, Oneida, N. Y., manufacturer of bottle caps and novelties, has awarded a contract to Ballard & Johnson, Oneida, for the erection of an addition, 85 x 137 ft., two stories, of brick and mill construction. Equipment details are not yet prepared.

The Industrial Engineering Company, Albany, N. Y., has received a contract from the Wright Health Underwear Company for an addition to its Aetna mill on Second avenue, Lansingburg, N. Y., to cost $33,000.

The De Meridor Company, Newburgh, N. Y., has been incorporated with a capital stock of $100,000 by R. H. Carthcart, Sr., O. J. and J. Carthcart and G. Witzchief and will engage in the manufacture of toilet preparations.

The Shuttleworth Bros. Company, Amsterdam, N. Y., have let contracts for the construction of an addition 28 x 150 ft., two stories, to its mill, to be of brick and hollow tile; also for an office building 40 x 50 ft., one story.

Townes Bros. & Co., Amsterdam, have let contracts for an addition, 80 x 90 ft., to be made to their mill on Grove street.

A company to be known as the Fullerville Power Company is being organized at Fullerville, N. Y., by Anson A. Potter and J. Finch, of Gouverneur, N. Y., who have purchased the Clark water power interests at Fullerville. The company will erect and equip a hydroelectric plant to develop about 2000 hp.

The mill of Doane & Jones, Elmira, N. Y., recently destroyed by fire, is to be rebuilt at once.

The Board of Public Works, Corning, N. Y., is planning to purchase a large air compressor and necessary pumps for pumping water from fourteen wells at a depth of 100 ft. From the impounding basin the water will be pumped by another set of pumps to the reservoirs situated on the hills above the city.

The Gardner Broom Company, Amsterdam, N. Y., is building a three-story and basement brick addition to its factory.

The Katonah Lighting Company, Katonah, N. Y., has received permission from the Public Service Commission to issue $75,000 in bonds immediately for the purpose of constructing its new steam plant and transmission line extensions.

The Fulton County Silk Mills Gloversville, N. Y., has plans in preparation for an addition, 45 x 60 ft., two stories and basement, of reinforced concrete construction, to be made to its plant on Kingsborough avenue.

The Carlton Machine Company, Syracuse, N. Y., has been incorporated with a capital stock of $100,000 to manufacture safety appliances and will establish a

plant for the purpose. F. A. Carlton, P. D. McCarty and E. C. Britcher, Syracuse, are the incorporators.

The main building of the Clark Wheel Works, Waterloo, N. Y., was damaged by fire recently. Reconstruction is under way.

Sweet Bros., Lestershire, N. Y., have completed plans for an addition 65 x 100 ft., which they will make at once to their foundry on Grand avenue.

The Luitwieler Pumping Engine Company, 125 Ames street, Rochester, N. Y., is having plans prepared for an additional factory building, which it expects to erect this summer.

The Clark Paper & Mfg. Company, 82 Mill street, manufacturer of paper and paste, Rochester, has let a contract for a factory and warehouse, 170 x 64 ft., four stories and basement, which it will erect at Dewey avenue and Ridge road, at a cost of $75,000.

Henry P. Neun, paper box manufacturer, 135 North Water street, Rochester, has plans in preparation for the construction of a power plant between Orchard and Whitney streets.

The Defender Photo Supply Company, Rochester, has let contracts for construction of a factory building, 61 x 384 ft., two story and basement, of steel and brick construction.

The King Sewing Machine Company, Buffalo, N. Y., W. Grant King president, is having plans prepared and will soon receive bids for four new buildings to be added to its plant at Rano and Welland streets. About 500 tons of steel will be required in their construction. Considerable new machinery and foundry and machine shop equipment will be installed.

The Modern Laundry Company, Buffalo, will erect and equip a laundry building, 60 x 120 ft., two stories, at 323 Niagara street, to replace its plant recently destroyed by fire.

The Buffalo Weaving & Belting Company, Buffalo, has plans completed for two new factory buildings to be added to its plant at Chandler street and the New York Central Railroad belt line. One building is to be 80 x 150 ft., three stories, and the other 80 x 150 ft., two stories, and are estimated to cost $100,000. Considerable new weaving machinery and other equipment will be installed. The architect is G. Morton Wolfe.

New England

BOSTON, MASS., July 23, 1912.

The hot weather, combined with the influence of the vacation time, has had no great effect upon business. The machine tool people are having a steady if not a rushing trade. The supply business is still better, the condition extending into such lines as valves and fittings.

The Hendee Mfg. Company, Springfield, Mass., will erect immediately a factory building on State street, to be 40 x 300 ft. and five stories. The purpose is to increase manufacturing facilities by the addition of new equipment and the employment of some 400 additional men, bringing the total of employees to 1600 and raising the annual output of motorcycles from 19,000 to 35,000.

Announcement is made that the Fritchie Electric Company, Denver, Col., will establish an Eastern factory and proposes to locate in Bridgeport, Conn. The plan is to secure immediately a building large enough to employ 100 men and to erect a plant which will manufacture automobiles on a large scale to supply the company's entire Eastern trade.

The Ford Motor Company, Detroit, Mich., will erect a large assembling plant at Boston, following its new policy of establishing subfactories, at least 11 in number, in the important centers, the purpose being to relieve the parent plant not of manufacturing but of assembling.

Additions to general manufacturing plants include that of the Woronoco Paper Company, Springfield, Mass., which will erect an additional plant at Woronoco to cost between $300,000 and $400,000, comprising four buildings, two to six stories, as follows: Machine building, 60 x 195 ft.; beater room building, 55 x 147 ft.; finishing room, 147 x 185 ft., and stock room, 85 x 147 ft. Other industrial extensions follow: Worthy Paper Company, Springfield, Mass., 50-ft. addition to existing works; I. Alpert & Sons, New Haven, Conn., shop addition, 22 x 41 ft., three stories; Shredwood Veranda Screen Company, Worcester, Mass., one-story addition, 50 x 70 ft.; White & Wyckoff, Holyoke, Mass., addition, 40 x 260 ft., six stories.

The American & British Mfg. Company has begun the manufacture of ordnance for the Government at its Providence works, and is at present engaged in the manufacture of a large number of gun carriages for use by the national guard of the various states, for demonstration purposes. The company's plant at Bridgeport is very busy on ordnance contracts for the Government.

The Melrose Gas Light Company, Melrose, Mass., will expend $250,000 for a large plant to be erected in the neighboring city of Malden.

The Cuba Importation Company, with American offices at Holyoke, Mass., has been incorporated in Massachusetts with a capital stock of $30,000. The company specializes on all kinds of machinery and supplies required by the sugar plantations of Cuba. The incorporators are Amedee De Briel and Gaston De Briel, Havana, and G. A. Savoy, Holyoke.

The National Spring Bed Company, New Britain, Conn., will increase its capital stock from $100,000 to $150,000, the new money to be used in taking care of the increased business.

Australian papers announce the formal opening of the Government rifle and bayonet factory which the Government has established at Lithgow. The equipment was furnished by the Pratt & Whitney Company, Hartford, Conn., at a cost of $340,000, in competition with British builders whose figures were much lower. The factory will produce the Enfield rifle, the standard British arm, at the rate of one per 23 man-hours, as against the 72 man-hours required at the Enfield factory and 48 man-hours at the Birmingham small arms factory.

Philadelphia

PHILADELPHIA, PA., July 23, 1912.

A fair volume of business continues to come out both merchants and manufacturers being benefited by a number of small orders. A few small groups of tools for plant extension have been contracted for, and some purchases of a general line of shop tools for small machine shops and special metal-working plants have been made. Considering the season the trade generally reports a comparatively fair volume of business. While a moderate demand for the general line of standard machine tools is noted, special equipment is in the better demand, particularly modern tools of the labor-saving type, and some classes of heavy special tools, such as cold saw cutting-off machines, presses, etc. Crane builders report a somewhat lighter demand, although some fair contracts have recently been entered. The demand for boilers, engines and general power equipment has not been particularly active, although a fair inquiry for the smaller power plants, largely for use outside of the general metal working trade, is noted. The export trade in general machine tools is quiet, although some occasional business in special machinery equipment is noted.

Business in second-hand machine tools and general equipment has been fair, sales being largely confined to metal working tools of modern types, for which there has been a comparatively good demand. The foundry trade continues to improve, although the heated term has restricted the productive rate. Steel casting plants are generally comparatively busy.

The Pennsylvania Railroad has an inquiry out for a 4-ft. radial drill.

The Philadelphia Electric Company has had plans prepared by John T. Windrim for alterations and additions to its power house and plant at Folsom, Pa. The building will be one story of brick.

The Eagan-Rogers Iron & Steel Company, Crum Lynne, Pa., has its new foundry plant about 95 per cent. completed. The plant is in partial operation and is expected to be working at full capacity in August.

The H. K. Mulford Company, Glen Olden, Pa., has been receiving bids for a one-story, stone addition to its boiler house, from plans by C. B. Keen, architect.

The Blore Mfg. Company, Camden, N. J., has been incorporated for $15,000, and will manufacture coin slot vending machines. James P. Blore, E. Burroughs, Camden, N. J., and O. E. Day, Collingswood, N. J., are named as incorporators.

David Coulter and associates have, it is stated, purchased the plant of the Economy Iron Works, Chester, Pa., and will operate it to manufacture boilers.

Robert Krook, carpet manufacturer, is receiving estimates for the erection of a manufacturing addition, 62 x 153 ft., two stories, and a power house, 26 x 57 ft., one story, to be erected at Walnut Lane and Main street, Manayunk, from plans by Peuckert & Wunder. The buildings are to be of reinforced concrete.

The Kutztown Foundry & Machine Company, Kutztown, Pa., is making additions to its plant, which will

increase the floor space of its foundry department by one-third and more than double that of its present machine shop. Additional machine tools and foundry equipment have already been contracted for, although additional machinery may still be purchased. The company expects the new buildings to be available for operation by October 1.

The John A. Roebling's Sons Company, Trenton, N. J., advises that recent reports in the daily press as to extensive improvements at the company's plant were exaggerated. A small temporary building has been built at its Trenton plant, which will be used for galvanizing small wire.

The S. S. Wenzell Machine Company, Fiftieth and Parkside avenue, which has been granted a charter under Pennsylvania laws, had previously been incorporated under the laws of West Virginia. The company manufactures machinery and supplies for distillers, brewers, bottlers, etc. Samuel S. Wenzell is president; Benjamin E. Linfoot, treasurer, and Joseph C. Haines, secretary.

In the item in this column, last week, regarding the increase in the capacity of the shipping and molding departments of the Lebanon Steel Foundry, Lebanon, Pa., manufacturer of crucible steel castings, the name of the company was erroneously stated as the Lebanon Steel Castings Company. W. H. Worrilow is president, and T. S. Quinn, secretary and treasurer of the Lebanon Steel Foundry.

The Gurney Elevator Company, Honesdale, Pa., has had plans prepared for a new plant to contain about 50,000 sq. ft. of floor space and will comprise one-story buildings of sawtooth and monitor roof construction. There will be a gray iron foundry and machine shop, woodworking shop and heating plant. Day & Zimmerman, Philadelphia, Pa., are the engineers in charge.

Chicago

CHICAGO, ILL., July 23, 1912.

The past week has brought out an unusual amount of inquiry for machine tools, of which the larger portion is for railroad uses. In addition to lists previously mentioned three railroads are asking figures on extensive equipments. The Elgin, Joliet & Eastern is in the market for about 30 machines and also a number of metal workers' tools for its new shops at Joliet. The Chicago, Rock Island & Pacific will purchase tools aggregating in value about $10,000, and the Missouri, Oklahoma & Gulf will buy equipment for the shops to be built at Muskogee, Okla., involving a similar expenditure. Other prospective business for industrial use includes machinery for export for the account of a local industry amounting in value to $10,000, while another inquiry for a new local shop will involve tools totaling between $4,000 and $5,000. The E. L. Essley Machinery Company, which has been one of the most active of the local machinery dealers despite the handicap of a severe fire early in the year, reports among its sales for the past week orders aggregating over $20,000.

The Elgin, Joliet & Eastern machine tool list is as follows:

One universal tool grinder.
One portable cylinder boring bar.
One No. 3 or 4 universal miller.
One 30 x 96 in. gap grinder, motor driven.
One guide bar grinder, motor driven.
One 13 in. friction drill, motor driven.
One cutter and reamer grinder.
Two 14 in. lathes, motor driven.
One drill grinder.
One 16 in. lathe, motor driven.
Two 20 in. lathes, motor driven.
One No. 2 horizontal boring and drilling machine.
One 26 in. traveling head shaper.
One horizontal slab milling machine.
One 21 in. drill.
One 2½ in. triple head bolt cutter.
One heavy 28 in. turret lathe.
One 48 x 48 in. x 16 ft. planer.
One 24 in. slotter, motor driven.
One 72 in. driving wheel lathe, motor driven.
One 10 ft. x ¾ in. bending rolls.
One 54 in. throat punch.
One lever tube shear.
One flue welding machine.
One annealing furnace.
One mud ring and flue sheet drill.
Two single punch and shear, 30 in. throat.
One 4 spindle stay bolt cutter.
One 25 in. throat punch and shear.
One heavy bulldozer.
One heading and forging machine.
One 100 lb. power hammer.

The Chicago, Rock Island & Pacific list is as follows:

One 18 x 108 in. lathe.
One 36 in. x 12 ft. lathe.
One 32 x 32 in. x 8 ft. planer.
One 26 in. shaper.
One double emery grinder, wheels 18 x 2 in.
One double emery grinder, wheels 10 x 1 in.
One twist drill grinder.
One double end punch and shear, 14 in. throat, capacity ½ in. through ½ in. material.
Two single head bolt cutters.
One 1250 lb. steam hammer.
One 60 ton hydraulic forcing press.

The Missouri, Oklahoma & Gulf list is as follows:

One 16 in. x 8 ft. lathe.
One 42 x 42 in. x 10 ft. planer.
One 16 in. x 6 ft. lathe.
One 42 in. boring mill.
One No. 3 universal miller.
One 2 ft. or 3 ft. radial drill.
One 1500 lb. steam hammer.

The Safety Gas Stove Company, Chicago, has been incorporated with a capital stock of $150,000 to manufacture stoves, furnaces and heating apparatus. The incorporators are David J. Elliott, Francis M. Kaufman and Harry C. Kehm.

The Alliance Mfg. Company, Fisher Building, Chicago, has awarded contracts for the building of a manufacturing plant, 60 x 141 ft., four stories, to cost $65,000.

The Chicago, Peoria & St. Louis Railroad Company has made arrangement to move its shops from Jacksonville, Ill., to Springfield.

The Ford Mfg. Company, Rockford, Ill., has made plans for doubling the capacity of its plant for which new power equipment is now being installed.

Precision Metal Workers, Chicago, has been incorporated with a capital stock of $2,500 to manufacture machinery, tools and dies. The incorporators are Erskine Campbell, Carl E. Carlson and W. R. Mitchell.

The International Register Company, Chicago, through the Condron Company, engineer, 53 Jackson Boulevard, is receiving tenders for the erection of a factory building 116 x 128 ft., three stories, to cost $45,000.

The contract for the new $350,000 shop of the Elgin, Joliet & Eastern Railroad Company, previously mentioned, has been awarded. The main building will be 160 x 600 ft., and will require an extensive equipment.

The Southern Illinois Railway & Power Company, Harrisburg, Ill., is having plans prepared for a new power plant in that city. The engineer is the W. H. Schott Company, 111 West Monroe street, Chicago.

The Singer Sewing Machine Company, 910 South Michigan avenue, Chicago, will erect a manufacturing building, 72 x 180 ft., three stories and basement, at 1015 West Jackson Boulevard.

The Pfanstiehl Electric Company, Waukegan, Ill., is preparing for the erection of additional plant capacity to accommodate the greatly increased business of the company.

The George B. Whitcomb Company, Rochelle, Ill., has let the general contract covering the building of a new plant to include a machine shop, 105 x 180 ft., a machine erecting building, 50 x 260 ft., boiler house and blacksmith shop, 40 x 80 ft. For the entire plant an expenditure of $200,000 is contemplated.

Karlsene & Skarin, Geneva, Ill., are about to build a factory building 40 x 65 ft., two stories, in which equipment will be installed for manufacturing marble cutters and auto supplies.

James Hogg, Chicago, through Raeder & Wood, engineers, 20 West Jackson Boulevard, will build a machine shop 80 x 116 ft., two stories, to cost $35,000.

The Reynolds Wire Company, Dixon, Ill., is having plans prepared for a four story addition to its plant in that city.

The W. H. Roscrans Engineering Company, Chicago, is preparing plans for shop buildings for the Missouri, Oklahoma & Gulf Railroad to be erected at Muskogee, Okla., at a cost of $400,000.

The Central Mfg. District, Chicago, is about to build a factory 100 x 225 ft., three stories, of brick and to cost $130,000.

The Garden City Foundry Company, Chicago, has been incorporated with a capital stock of $10,000 to op-

erate a foundry and machine shop. The incorporators are J. M. Dresser and H. M. Fernbac.

The Eli Bridge Company, builder of Ferris wheels, is about to locate at Springfield, Ill., where a new factory will be built.

The Mason Novelty Company, Waterloo, Iowa, has arranged for the building of a new factory at Mason City, Iowa.

The Watrous Mfg. Company, Des Moines, Iowa, has been incorporated with a capital stock of $30,000 to manufacture hardware and metal specialties. The directors are David B. Gann, Henry E. Colton and Frederick Secord.

The Iowa Portland Cement Company, Des Moines, Iowa, is about to increase its output 1000 barrels daily and will require additional machinery, particularly power equipment.

The Hackney Mfg. Company, St. Paul, Minn., will erect a two story factory building to cost $10,000 at Prior and University avenues, in that city.

The Eagle Iron Works, Minneapolis, Minn., has purchased a site at Ninth avenue South and Fifth street upon which a building 44 x 140 ft. will be erected. New machinery will be required.

The Minneapolis, St. Paul & Sault Ste. Marie Railroad will spend $25,000 in the improvement of its facilities and equipment at Fond du Lac, Wis., including the addition of a 10 stall roundhouse.

The Chain Belt Company, Milwaukee, Wis., has purchased the plant of the Prescott Malleable Iron Company at West Milwaukee and will equip it for the manufacture of chain belts and conveyors.

The Cutler-Hammer Company, Milwaukee, Wis., has taken out a permit for the erection of a $7,500 addition to its plant on St. Paul avenue.

The Cream City Foundry Company, Milwaukee, Wis., Fifteenth and Oklahoma avenues, is contemplating the building of an addition to its plant at a cost of $15,000.

The Kissel Kar Company, Hartford, Wis., has begun the erection of an addition to its plant to be 100 x 100 ft.

The Barnard & Leas Mfg. Company, Moline, Ill., whose plant was recently destroyed by fire, has had plans prepared by Day & Zimmerman, engineers, Philadelphia, Pa., for a new plant to contain about 60,000 sq. ft. of floor space, and will be composed mostly of one-story sawtooth roof buildings, steel frame and mill construction. The manufacturing departments will be light and heavy machine shops, woodworking and assembling shops.

Cleveland

CLEVELAND, OHIO, July 23, 1912.

Dealers are getting a fair volume of scattered orders, mostly for single tools. While the demand is not heavy, business is considered good for this season. Considerable business is in prospect for equipment of new plants and additions. Local machine tool builders are generally well filled with orders. A builder of drilling machinery has practically sold the entire output of the plant until November and has made some sales for delivery at a later date. Improved conditions in the foundry trade have resulted in a good demand for various kinds of foundry equipment. There is a good call for industrial cars and locomotives. In electrical lines there is a fair demand for small motors, but there is not much inquiry for large equipment. The demand for pneumatic tools is fairly active.

The city of Cleveland will shortly receive bids for two 300-hp. boilers to be installed in the Fairmount pumping station for establishing a municipal heating plant.

The Miller Rubber Company, Akron, Ohio, has purchased a site on which it intends shortly to erect a new plant.

The King Valveless Auto Whistle Company, Cleveland, Ohio, has been incorporated with a capital stock of $25,000 by Delroy Piffield, O. C. Snyder, George H. Burrows and others.

The Modern Sheet Metal & Machine Company, Canton, Ohio, has been incorporated with a capital stock of $100,000 by John F. Moul, Elmer J. Welty, G. F. Andrews and others.

It is reported that Armour & Co., Chicago, will build a large cold storage plant at Mansfield, Ohio.

The Reynolds Aluminum Company, New Washington, Ohio, has been incorporated with a capital stock of $10,000 by F. W. Reynolds, Edward Geissman, J. A. Jacobs, H. M. Kibler and J. H. Donaldson.

The Sterling Vacuum Cleaner Company, Sebring, Ohio, has been incorporated with a capital stock of $10,000 by F. H. Sebring, Charles L. Sebring, W. E. Thompson and others.

The Ecothermal Stove Company, which some time ago established a plant in Warren, Ohio, for the manufacture of stoves, has been incorporated with a capital stock of $150,000 by J. W. Taylor, George T. Fillius, Stephen S. Thomas and others.

The Kent Machine Company, 958 Libbey street, Toledo, Ohio, will enlarge its plant by the erection of a two-story brick building 150 x 250 ft.

The New Tool Company, 431 Champlain avenue, Cleveland, maker of die heads, has increased its capital stock from $5,000 to $15,000. A reorganization of the company is planned.

The Rapp Mfg. Company, Toledo, Ohio, has been incorporated with a capital stock of $15,000 to make spark plugs and gas and gasoline engine accessories. S. W. Rapp, C. D. Stone, S. L. Thoburn and others are the incorporators.

The Taplin-Rice-Clerking Company, Akron, Ohio, builder of stoves and warm air furnaces, will build a new three-story factory building. It will be of brick, steel and concrete construction.

Cincinnati

CINCINNATI, OHIO, July 23, 1912.

With the majority of machine tool builders July has been a fairly satisfactory month thus far. Domestic business has been on the mend, and the foreign trade is still holding its own. As this is the summer vacation period, the increasing number of scattered orders for single tools is considered very encouraging. There are also several large lists before the trade, that have been previously mentioned, buying against which is expected to be completed within the next six weeks. The second-hand machinery trade is very dull just at the moment, although there is some business coming from the South. Electrical equipment continues in good demand, and there is also some improvement reported from the foundries in this vicinity.

Local machine tool builders are bidding on the following list of lathes wanted by the De La Vergne Machine Company, New York: One 31-in. x 16-ft. gap lathe, motor driven; one 30 x 16 ft. gap lathe, motor driven; one 24-in. x 16-ft. engine lathe, motor driven; two 24-in. x 14-ft. engine lathes, motor driven; one 18-in. x 12-ft. engine lathe, motor driven; one 18-in. x 10-ft. engine lathe, motor driven.

The United States Bung Mfg. Company, Cincinnati, has had plans prepared by Samuel Hannaford & Sons for a three-story warehouse addition to its plant on Evans street. Two freight elevators, with motors, will be all the equipment required.

The Cocoran Mfg. Company, Cincinnati, has been organized to manufacture automobile tools and specialties, and has leased a five-story factory building at Second and Elm streets, which will be fitted up with the necessary equipment at an early date. John L. and H. R. Cocoran are the principal members of the new firm.

Several local contractors are submitting bids on a large roundhouse to be erected at Terre Haute, Ind., by the Big Four Railroad, and for which considerable structural material will be required.

The Cincinnati Gear Company announces that it expects to be in its new home on Reading road about October 1. Foundations for the new factory have already been completed.

The State of Ohio will soon be in the market for a miscellaneous lot of equipment, including knitting mill, soap making and other machinery, for installation in the State Penitentiary at Columbus.

The Dayton Engineering Laboratories Company, Dayton, Ohio, has increased its capital stock from $250,000 to $350,000.

Additional electric generating equipment will be required for enlarging the city lighting plant at Glasgow, Ky. The plant was recently purchased by a new company, headed by Dickenson Brothers, of Glasgow.

C. O. Prowse is the head of the Prowse Aeroplane Company, Hopkinsville, Ky., recently incorporated with $25,000 capital stock to erect a plant for manufacturing aeroplanes.

The Greendale Distilling Company, Lawrenceburg, Ind., has awarded contract for a 10-story fireproof warehouse to J. R. Stevens & Co., Cincinnati.

The Hotel Gibson Company, Cincinnati, will receive bids August 1 for the refrigerating equipment to be installed in its proposed 12-story hotel building. B. L.

Baldwin and Gustav W. Drach are architects in charge of the plans.

It is reported that the American Strawboard Company, Dayton, Ohio, is having plans prepared for rebuilding its plant that was destroyed by fire several years ago.

The Daubenspeck-Fuller Mfg. Company, Parkersburg, W. Va., has been incorporated with $10,000 capital stock to manufacture a combination fire escape and clothes-tree. P. E. Daubenspeck and E. F. Fuller are the principal incorporators.

The Edgemont Machine Company, Dayton, Ohio, whose plans were recently mentioned, has commenced work on a two-story brick factory building, located at National and Niebert avenues.

Detroit

DETROIT, MICH., July 23, 1912.

Business among the machinery dealers shows somewhat of a falling off but the outlook continues satisfactory. Inquiry for miscellaneous tools, both in Detroit and adjacent territory, is fair, and the amount of business now under negotiation is considerable. Shop and mill supplies are in active demand and this trade amounts to quite a large item with some dealers. The second-hand machinery market seems to drag, although two sales of six and seven tools respectively to upstate manufacturers were noted. Power transmission equipment is quiet. Industrial conditions in the metal and allied industries are all that could be asked for, the shipbuilding companies, automobile makers and stove manufacturers being all well engaged. Jobbing foundries and manufacturing machinists also report an excellent volume of business.

Municipal business this summer has been somewhat disappointing; there have been few installations of waterworks or electric lighting plants and additions and replacements in plants of this nature have mostly been of a minor character. On the other hand, considerable roadmaking equipment has been purchased and sewer contracts have been of large volume.

The Suburban Motor Car Company, Detroit, recently incorporated, has awarded a contract for the erection of the main building of its plant. The structure will be 352 x 800 ft., one story and of saw-tooth roof construction. A power house 160 x 200 ft. will also be erected and the plans call for four additional buildings to be erected later, each 60 x 400 ft. The mechanical equipment will be the most modern obtainable and will be operated by individual motor drive.

The Vanguard Mfg. Company, Detroit, manufacturer of windshields, has begun the construction of its new plant and will remove its business from Decatur, Ill., as soon as the buildings are completed. The structures will be one story, 90 x 200 ft. and 30 x 140 ft., respectively.

Ralph L. Aldrich and Frank W. Blair, Detroit, have purchased the property of the Creston Gas & Electric Light Company, Creston, Iowa, and will immediately expend $60,000 in improving and enlarging the plant.

The Detroit Battery & Ignition Company, Detroit, has been incorporated with $200,000 capital stock by Charles R. Baxter, Louis C. Knop and Charles F. Tomlinson. The new company will take over and consolidate the plants of the American Ignition Company and the Knop Battery Company, and will manufacture a line of storage batteries, automobile lamps and ignition devices.

The Universal Motor Truck Company, Detroit, has cancelled the option on its plant held by Walter E. Flanders and associates and will continue its operations. The capital stock of the company is to be increased to $1,000,000 and extensive additions to its plant have been decided upon.

The G. & G. Mfg. Company, Detroit, has been incorporated with $7,500 capital stock to engage in the manufacture of tools and automobile parts. The incorporators are John A. and Max Grabowski and Walter J. Grant.

The Zenith Carburetor Company, Detroit, has filed notice of an increase of capital stock from $10,000 to $30,000.

The Metal Shingle Company has commenced operations in its new plant at 343 Bellevue avenue, Detroit. The company manufactures interlocking galvanized iron shingles and has doubled its facilities to care for its rapidly expanding business.

The Standard Brass Works, Detroit, has taken out a building permit covering the erection of a two-story brick factory 92 x 166 ft., to cost $24,000.

The Schoenborn-Cowles Mfg. Company, Detroit, has been incorporated with a capital stock of $15,000, by Gustav Schoenborn, James G. Cowles and Clarence A. Puffer, to take over and continue a partnership business of the same style. The company is a manufacturer of special machinery and screw machine products and will gradually enlarge its operations.

N. R. Washburn and associates, Charlevoix, Mich., have formed a stock company and will engage in the manufacture of concrete mixers.

The M. Rumely Company, Battle Creek, Mich., manufacturer of threshers, etc., has acquired the old plant of the Malta Vita Company and will install new machinery. In addition the company will spend $30,000 in other improvements, including the erection of a new warehouse and the enlargement of the foundry and carpenter shop.

The Lewis Spring & Axle Company, Jackson, Mich., is planning to add the manufacture of automobile trucks to its activities and to this end will erect a new factory building adjoining its present plant.

The American Gear & Mfg. Company, Jackson, Mich., will erect a new factory building 175 x 250 ft. and two stories, to provide for expansion of its business. The company manufactures gears and accessories thereto.

The Goodwin Corset Company, Jackson, Mich., has completed plans for the erection of a new plant.

W. B. Beam, Mancelona, Mich., will establish a sawmill plant at that point. The equipment has not been purchased.

The Elkhart Mfg. Company, Monroe, Mich, manufacturer of automobile accessories has filed notice of an increase of capital stock from $60,000 to $110,000.

The English Company, Detroit, manufacturer of automobile accessories, has increased its capital stock from $5,000 to $100,000, and will take over the plant and property of the Auto Gas Engine Starter Company.

The Kenyon Searchlight Company, Detroit, has been incorporated with a capital stock of $75,000 to manufacture searchlights and other automobile accessories. The incorporators are H. B. Kenyon, H. E. Bloomingdale and C. F. Bloomingdale.

The Durham Easy Loading Truck Company, Detroit, has been incorporated with $50,000 capital stock to manufacture trucks and other mechanical devices. J. M. Makey is the principal stockholder.

The Enameled Steel Tank Company, Kalamazoo, Mich., suffered a loss of $30,000 as the result of a fire which damaged the stock, machine and welding departments. Repairs will be made and operations resumed as soon as possible.

The Saranac Machine Company, Benton Harbor, Mich., has placed a contract for the erection of a machine shop, 60 x 192 ft., one and two stories. The company was recently incorporated with W. H. Ray as president.

Indianapolis

INDIANAPOLIS, IND., July 23, 1912.

The plant of the Insley Mfg. Company, suffered a loss of $12,000 by fire July 19. The company manufactures contractors' and industrial equipment. Most of the machinery and part of the stock of steel patterns were saved, although a heavy loss was sustained in blue prints and wooden patterns. The plant will be rebuilt.

Franklin Vonnegut, of the Vonnegut Hardware Company, Indianapolis, has been appointed receiver for the Mais Motor Truck Company. Will H. Brown is president of the company. The plant will be ordered sold.

Foster V. Smith has been appointed receiver for the Rollyn Hawkins-McCain Company, Indianapolis, manufacturers of furnaces, of this city.

The Indianapolis Tire Company, Indianapolis, has been incorporated with $300,000 capital stock to manufacture automobile tires, covers and parts. The directors are A. A. McKain, E. J. Holliday, D. M. Parry, H. G. Wright and A. C. Ayres.

The incorporation of the Rutenber Motor Company in New York, with $1,350,000 capital stock, is believed to indicate the consolidation of the plants of the Western Motor Works at Marion and Logansport, Ind., the transfer of machinery being made from Logansport to Marion. The appearance of the name of George W. Bowen among the directors is taken to mean that the consolidation will include the Bowen Mfg. Company of Auburn.

J. C. Teegarden of Anderson, Ind., has been ap-

pointed receiver for the De Tamble Motors Company, of that city, by the referee in bankruptcy. The company manufactured automobiles.

The Highland Water & Power Company, Highland, Ind., has been incorporated as a public service company. The directors are A. L. Renner, J. J. Munster and Frank Bernwanger.

The Riggs Clay Products Company, Sullivan, Ind., has been incorporated with $20,000 capital stock, to manufacture clay products. The directors are J. R. Riggs, C. L. Davis and F. Jones.

The Brown Commercial Truck Company, Peru, Ind., has been incorporated with $100,000 capital stock, to manufacture motor trucks. The directors are William H. Brown, R. H. Bouslog, C. H. Walerick, R. A. Edwards and Max Kraus. Messrs. Brown and Walerick are of Indianapolis, where they have been connected with the Mais Motor Truck Company.

The Southern Indiana Bending Company, Depauw, Ind., has been incorporated with $10,000 capital stock, to manufacture bent wood articles. The directors are J. H. Stierstedter, C. W. Smith, M. G. Roehm, J. F. Bird and S. T. Briscoe.

The Jenney Electric Starter Company, Indianapolis, has been incorporated with $100,000 capital stock, to manufacture electrical and mechanical devices for starting gasoline and gas engines. The directors are C. D. Jenney, Russell Wilson and W. L. Taylor.

The Hoosier Mining Company, Vincennes, Ind., has increased its capital stock from $24,000 to $200,000.

The City Council of Greenfield, Ind., will spend several thousand dollars in improving the municipal electrical plant.

The Ward Fence Company, Decatur, Ind., is purchasing punching, drilling and sawing machinery, wire straightening and forming machines, lathe and shaper for which a total expenditure of $9,500 is contemplated.

The Central South

LOUISVILLE, KY., July 23, 1912.

The general tone of business has been quiet although no complaints of moment are being heard. The lull was apparently expected, and has been largely offset by business already contracted for, which is keeping manufacturers busy. Dealers report the number of inquiries smaller than for some time, but believe the remainder of July, along with August, will show satisfactory returns. Electrical equipment is not moving as briskly as heretofore, but boilers are selling better than most other equipment. Woodworking machinery is an active mover.

The Board of Education, Louisville, will let contracts shortly for the installation of a heating plant at the Montgomery street school; a heating plant at the Sixth street school, and boilers at the Lucia avenue school. S. D. Jones is business director.

F. A. Clegg & Co., Louisville, have the contract for the installation of a new power plant at the Galt House, Louisville. The cost of the plant will be about $15,000.

The Selden-Breck Construction Company, St. Louis, has been awarded the general contract for the erection of a 15-story office building for John P. Starks at Fourth and Walnut streets, Louisville. Work will begin at once. Subcontracts for the structural material will be let, but the company will probably install the iron work with its own labor.

L. R. Veatch, First and A streets, Louisville, who manufacture and repair flour milling machinery, is to erect an addition to his shop and will require some equipment.

The Horan Stay Hanger Company, Louisville, has been incorporated with $1,000 capital stock to manufacture metal, steel and tin novelties. George J. Ogle is the principal stockholder.

R. A. Choate plans the erection of a plant for the manufacture of sash, doors and other millwork at Frankfort, Ky. Woodworking and power machinery, will be needed.

J. A. Shoop, Danville, Ky., has applied for an electric light franchise at Williamstown, Ky., and plans the erection of a plant as soon as the franchise is created.

The Nashville, Chattanooga & St. Louis Railroad, with headquarters in Nashville, Tenn., is reported to be planning the establishment of large repair shops and a roundhouse at Paducah, Ky. The improvements are said to be the result of the prospective erection of the Burlington bridge over the Ohio River near Paducah.

An office building to be erected at Hopkinsville, Ky., by E. C. Radford, T. J. McReynolds and others, will be equipped with a steam heating plant.

New capital has been interested in the Ames Motor Car Company, Owensboro, Ky., and it is to have a capital stock of $100,000 and the output of the factory will be increased to 2000 cars a year. F. A. Ames is to be president, and G. W. Yeoman, Detroit, Mich., vice-president and general manager. Additional buildings will be erected and a considerable amount of new equipment installed. This may not be needed until the latter part of the year.

It is reported that Whitley City, Ky., is considering the establishment of an electric light plant and waterworks. The establishment of a glass plant at Whitley City is also probable, it is stated.

The Cumberland Lumber Company, Sparta, Tenn., has purchased 3000 acres of hardwood timberland, and will install a bandmill and a large steam log skidder.

The Southern Lumber & Mfg. Company, Nashville, Tenn., which has purchased 4000 acres of timberland near Sparta, Tenn., will install a large sawmill for its development.

The Newport Produce Company, Newport, Tenn., will install machinery for the manufacture of corn meal. The capacity of the plant is to be 100 barrels a day.

The Gist Mfg. Company, Sparta, Tenn., has been organized with $5,000 capital stock, for the manufacture of hardware and carriage specialties, including a patented single-tree. J. R. Lee is president and S. J. Jackson secretary of the company.

The hardwood flooring plant to be established at Nashville, Tenn., to which reference was recently made, will be operated by Charles Morford, C. P. Street and others. A building has been secured and machinery will be installed at once.

H. Reaves, Greenville, Tenn., is in the market for two 10 kw. generators, with exciter, and two 20 hp. vertical automatic engines. Immediate delivery is desired.

W. W. Worley, Vaughtsville, Tenn., is in the market for a 40 kw. generator, a switchboard, transformers and other equipment for installation in an electric power plant.

Improvement in the sawmill trade is reported by the John P. Dale Machinery Company, Nashville, Tenn. The lumber business in the Central South has been showing improvement following the dull spring, and many new mills are being installed. The concern has sold sawmill plants recently to W. J. Beasley, Franklin, Tenn., and to Humphrey Bros., Hohenwald, Tenn.

J. L. Nicholson, Henderson, Ky., is contemplating the enlargement of his ice and cold storage plant. The plant was established only recently.

Dickinson Bros., W. F. Richardson and P. W. Holman, Glasgow, Ky., have purchased the electric light plant there and will enlarge it sufficiently to provide current for day use and power purposes. The changes will be made in the near future.

The Salem Iron Works, Winston-Salem, N. C., is in the market for a modern vertical boring and turning mill, second hand preferred.

Birmingham

BIRMINGHAM, ALA., July 22, 1912.

The tone of the machinery market is very good. Inquiries are on the increase and there is a respectable volume of business, which is handicapped to some extent by delays in delivery and hampering of operations at mills by the frequent rains usual at this period of the year. The second half of the year has made a good start and the prospect is that business will run ahead of the same time last year in many respects. Engines, boilers and mill supplies are all going in fair quantities. The feature of the situation is the increasing and vigorous demand.

The city of Dothan, Ala., will receive bids until August 15 for machinery, etc., for water and electric light and power plants.

A charter has been granted to the National Cellulose Company, Savannah, Ga., to establish a plant for the manufacture of cellulose, paper and other products. D. H. Burrell, New York, and C. H. Tenny, Springfield, Mass., are among the incorporators.

Plans are being prepared for the establishment of a phosphate elevator by the Seaboard Air Line at Tampa, Fla. Charles R. Capps, vice-president, Norfolk, Va.

The Sale City Gin & Mfg. Company, Sale, Ga., has applied for charter to erect a fertilizer factory. The incorporators are F. S. Perry, A. T. Jones and others.

A company is being organized at Barnesville, Ga., to establish a ginnery with a daily capacity of 100 bales. C. O. Summers and others are interested.

An ice plant will be established at Augusta, Ga., by S. M. McKendree, of Spartanburg, S. C., and others. It will have 30 tons capacity and is estimated to cost $30,000.

H. J. Peagler and others are organizing to establish an electric light plant at Homerville, Ga.

The Atlantic Coal Company, Birmingham, will improve new mine property by the installation of mining machinery, etc. W. E. Saulsbury is president.

The Jefferson Fertilizer Company, J. G. Whitfield, president, is preparing to establish a $150,000 oil mill in Birmingham, Ala.

The Gulf Pulp Wood Company, Apalachicola, Fla., has applied for a charter. It proposes to manufacture pulp wood, lumber, etc. B. H. Beverley and others, of Apalachicola, and J. L. Anderson, of Atlanta, Ga., representing the Georgia Pulp Wood Company, are interested.

L. B. Bessinger will establish turpentine distilleries on a tract of 10,000 acres near Blanton, Fla.

Application has been made at Savannah, Ga., for the incorporation of the Magnolia Pine & Cypress Company, with a capital stock of $1,000,000. The incorporators are W. J. Kin and others.

The Killian Lumber Company, Valdosta, Ga., has purchased a large tract of timber at Tillman, S. C., and will at once establish sawmill, dry kiln, etc.

Proposals will be received by the city of Augusta, Ga., until August 2 for additions to water filtration plant. Filter tanks and apparatus will be required.

Architects Bonfoey & Elliott, of Tampa, Fla., are preparing plans for a factory for the Consumers' Ice Company at Tampa.

The Albany Cotton Mfg. Company, Albany, Ga., has been chartered with a capital stock of $110,000, to operate cotton mills. W. W. Pace is principal stockholder.

The work of constructing new buildings for the Ashland Oil Mill & Fertilizer Company, Ashland, Ala., has been begun. A private water system is to be installed.

St. Louis

ST. LOUIS, MO., July 22, 1912.

The conditions in the machine tool market here are quiet, but on the whole satisfactory. There is a fair total of business, but mostly in single tools and somewhat scattered, though the aggregate is good. No large lists have come out, but there is some replacement business in sight and some small request for second-hand tools. Collections are reasonably satisfactory..

The Southern Traction System, which has a franchise to enter St. Louis from Duquoin, Ill., has purchased a site for its shops, offices and local power house on the east side of the Mississippi River. Construction work will begin at once, and equipment will soon be considered.

The Aluminum Ore Company, Pittsburgh, Pa., has ordered plans for an addition to its present plant in East St. Louis, Ill., which will practically double the capacity of the plant and which, with the equipment, will involve an expenditure of $300,000 or more.

The Mississippi Valley Cold Storage Company, St. Louis, with $500,000 capital stock, has been incorporated by G. W. Stewart of Chicago, Frank C. Patten and W. R. Humphreys of St. Louis, and will soon be in the market for cold storage apparatus for the warehouse which they have purchased and which will be remodeled for cold storage purposes.

The St. Louis Dairy Company, St. Louis, has bought a site for a branch which will be equipped with a refrigerating plant and other mechanical apparatus for the extension of the company's existing business.

Fire in the plant of the East St. Louis Cotton Oil Company, East St. Louis, Ill., the past week caused $50,000 damage, largely to machinery, which will be replaced at once.

The United Railways Company, St. Louis, has bought a site and will at once proceed with the erection of a transformer plant. The building and equipment will cost about $250,000.

The Webb Motor Fire Apparatus Company, St. Louis, has merged with the Allentown Foundry & Machine Company, Allentown, Pa., and will remove to Allentown, reorganize under another name and considerable new equipment will be added for the enlargement of the business.

The General Paper Stock Company, St. Louis, has contracted for a $70,000 addition to its converting plant, which will require considerable mechanical equipment.

An addition to the plant of the Broderick & Bascom Rope Company, manufacturer of wire rope, etc., has been ordered built. Some mechanical equipment will be required.

The Crunden-Martin Woodenware Company, St. Louis, has begun the construction of a large addition to its plant which will be equipped with the necessary mechanical apparatus for enameling ware on a large scale. The enameling furnaces will be operated with crude oil.

The largest single order for motor fire apparatus yet given by a city has been placed with the Fire Apparatus Mfg. Company, St. Louis, which is to equip the entire Youngstown fire department, embracing three auto pumping engines, and two auto hose and chemical wagons, to cost about $50,000.

The Calhoun Clay Products Company, St. Louis, has authorized a bond issue of $75,000 which is to be utilized in the equipment of a plastic brick plant at Golden Eagle, Calhoun County, Ill., requiring considerable machinery.

A supplementary transformer station site has been bought in St. Louis at Gravois and Ann avenues to refine the current to be distributed in the southern part of the city. A station will be built and equipped.

The E. Metzenaur Baking Powder Company, of St. Louis, has been incorporated with $40,000 capital and will equip a plant for the grinding and preparing of baking powders and similar products.

The W. H. Powell Lumber Company, St. Louis, with $40,000 capital stock, has been incorporated by W. H. Powell and others.

The Burns-Ramsden Motor Car Company, St. Louis, has been organized by Louis N. Burns, J. H. Ramsden, O. E. Carter, C. K. Rowland and others, for the purpose of equipping a plant for the manufacture of automobile motors.

The St. Francois Crushed Granite Company, Knob Lick, Mo., has been incorporated with $40,000 capital stock by C. B. Scott, Ed. Henderson and M. W. Manley and will install a plant for the crushing of rock.

The Mutual Brewing Company, St. Louis, which is building a brewery, has increased its capital stock from $150,000 to $250,000 in order to increase the capacity of the plant over what was the original intention.

The Independent Harvester Company, Kansas City, Mo., has been organized with $200,000 capital stock by J. F. Thompson, W. W. Crimmin and H. M. Jones, to equip a plant for the manufacture of agricultural machinery.

The Chicago Tool Company, incorporated in New Jersey, has been authorized to use $7,500 of its $125,000 capital stock in a branch plant at St. Louis for special work.

The Commerce Trust Company, Kansas City, Mo., has plans for the equipment of a $75,000 plant in the basement of its building to furnish heat, light and power to consumers within the city block in which the building is located.

The J. H. Miner Saw Works, Hattiesburg, has been organized with $35,000 capital stock, to equip a plant for the manufacture of saws, etc.

The Pittsboro Gin & Mfg. Company, Pittsboro, Miss., will build and equip a ginnery with 20-bale capacity.

Wadsworth & White have completed arrangements for the construction and equipment of a cold press cotton seed oil mill.

The Excelsior Lumber Company, Sturgis, Miss., will install and equip a mill and box factory at once to cost about $20,000. The officers are W. T. Pride, Memphis, president; W. F. Clary, Memphis, vice-president; C. S. Waller, secretary.

The Dudley Bros. Mfg. Company, Russellville, Ark., is preparing to install machinery to be operated in conjunction with their box and crate factory already existing.

The West Jellico Consolidated Coal Company, with $100,000 capital stock, has been incorporated at Jellico, Tenn., by S. E. Hodges, R. D. Taylor and A. Y. Burrows and others to develop and operate coal lands owned by them.

The Stigler Ice & Electric Company, Stigler, Okla., with $45,000 capital stock, has been incorporated by R. L. Coleman, G. A. Holley, M. J. Coleman, U. and C. Pyle, to build and equip an ice and electric plant.

The Oklahoma City Steel & Wire Works, Oklahoma City, Okla., has been incorporated by A. G. and E. Sutherland, and P. J. Hodgins and others.

The Burke Mining Company, Bartlesville, Okla., has been incorporated with $40,000 capital stock by Leslie Coombs, L. T. Harned, W. A. Smith and others to develop property owned by them.

The Southwestern Iron Company, Guthrie, Okla., is adding new machinery to its shop equipment.

At Horton, Kan., favorable action has been taken in the matter of issuing bonds to the amount of $38,000 for the improvement of city water works.

Texas

AUSTIN, TEXAS, July 20, 1912.

With the practical assurance that the cotton crop will be as large if not larger than last year when a total production of approximately 4,200,000 bales was Texas' record there are being installed many new cotton gins, compresses and cottonseed oil mills in different parts of the state. The demand for this class of machinery is larger than ever known. The formation of new irrigation projects continues unabated. The machinery and tool trade is keeping up during the hot weather period remarkably well.

The Farmers' Union, Sabinal, will install a cotton gin at that place.

Steps have been taken by the Commissioners' Court of San Saba County to create an irrigation district to embrace 50,000 acres of land in the valley of the San Saba River. Bonds will be issued to construct the necessary works.

An election of taxpayers will be held at Yoakum, August 15, to vote on the proposition of issuing $32,000 of bonds for the construction of a sewer system.

The Wise County Oil & Gas Company, Decatur, has been organized for the purpose of boring oil wells. It has a capital stock of $50,000. The incorporators are T. L. Ball, A. C. Hoyl, A. B. Conley and others.

The Brans-Glass Engineering & Development Corporation, Dallas, has been organized with a capital stock of $50,000. The incorporators are Herman Brans, James L. Glass and J. D. Mathews.

The taxpayers of Madisonville have voted $16,000 of bonds for the purpose of installing a waterworks plant and distributing system.

The Consolidated Reservoir Company, which has just been organized with a capital stock of $1,000,000 with principal office at Grandfalls, will construct a system of irrigation that will water a large tract of land near that place. The incorporators are M. T. Eualy, Earl A. Keifer, H. W. Jones, A. J. Adcock, J. L. Farley and James Lett.

J. B. Harlan has purchased a site at Laredo for a flour mill, the erection of which he will soon begin. The proposed mill will have a capacity of 100 barrels of flour per day.

The taxpayers of Port Arthur have voted favorably on the proposition of issuing $460,000 of bonds, of which $300,000 is for the purpose of purchasing the local waterworks plant and sewer system. The remaining $160,000 will be used for improving the properties.

The Schulenberg Light & Ice Company, Schulenberg, has been organized with a capital stock of $20,000. The incorporators are Gus Russek, Charles A. Bogt and E. J. Russek.

F. W. Schuerenburg, Inc., is the name of a corporation that has just been organized with headquarters at Brenham for the purpose of manufacturing farm implements and tools.

The San Antonio Packing Box Company, which has been organized at San Antonio with a capital stock of $20,000, will manufacture boxes. The incorporators are H. H. Radley, L. C. Wiggins and Joe L. Strickley.

The Pine Island Oil Company, Beaumont, has been organized for the purpose of operating in Texas oil fields. The incorporators are Guy Junker, Geo. W. Caswell and W. W. Cunningham.

R. H. Deyo & Son will install a cotton gin at Lyford.

The Planters' Gin Company will install a cotton gin at Maysfield. H. L. Yeager is interested.

C. A. Carlton will install two irrigating pumping plants upon his land near Plainview.

The City Council of Pecos has under consideration plans for a new waterworks plant and distributing system there.

The United Sugar Company will make improvements to its sugar refinery and mill situated near Guaymas, Mexico.

The Caldwell Electric Power & Ice Company, Caldwell, has been organized with a capital stock of $10,000. The incorporators are M. L. Womack, C. C. Melms and Geo. M. Johnston.

Engineers representing a British syndicate which is headed by Dr. F. S. Pearson of New York are making a survey for a proposed dam across the Devil's River and a large system of irrigation, construction of which is under consideration. The plans also involve the installation of a large hydroelectric plant and the building of power transmission lines to a number of towns.

The Federal Government of Mexico has had estimates prepared of the proposed harbor improvements and port works which it is preparing to make at Mazatlan at a cost of about $10,000,000 gold. The contract will probably be let in a short time.

The Freeport Sulphur Company, which has been organized with a capital stock of $200,000, is preparing to mine and refine sulphur near Freeport, Texas, on a large scale. The incorporators of the company are Eric P. Swenson and S. A. Swenson of New York, Siedell Tilghman of New Jersey, William T. Andrews and Charles A. Jones of Stamford, Texas.

John J. McNarney will install a 60-ton reduction mill at his mine 35 miles from Casal, Sonora, Mexico.

The City Commission of Sulphur Springs, Texas, will soon install a modern pumping station on White Rock creek two miles north of Sulphur Springs where a system of locks and dams will be built sufficient to impound more than 15,000,000 gal. of water. An 8-in. main will be laid from the reservoir to Lake Coleman in the city limits which has a capacity of 20,000,000 gal. Bonds in the sum of $30,000 have been issued for the purpose of making the improvements.

The Delta Electric & Mfg. Company has been organized at Cooper with a capital stock of $15,000. The incorporators are R. J. Thomas, M. Chester Smith and Charles Hardy.

The Amarillo Gas Company will make extensive improvements to its plant and distributing system at Amarillo.

Plans are being made for the construction of a large system of irrigation near Bracken. Dams will be constructed across Cibolo Creek and Comal River for the purpose of storing water that will irrigate between 50,000 and 100,000 acres of land. The parties interested in the project are Emil Locke and Paul Knittel of San Antonio, Adolph Holtz of New Braunfels, Frank S. Rockefeller of Russell, Kan.

The Pacific Coast

SAN FRANCISCO, CAL., July 16, 1912.

The machine tool business for the last fortnight has been extremely dull, and there is nothing to report aside from a few sales of small tools and single-tool orders from the garage trade. A good many tentative inquiries for special equipment are coming out from local shops, but there is no assurance that any business will result. Most shops could handle a great deal more work than they have on hand, and are not likely to make any large improvements for some time. There is some prospect of railroad business in southern California, but so far no definite inquiry has been received from that quarter. The Pacific Electric Railway has secured a large addition to its site at San Bernardino, Cal., on which it is expected that shops will ultimately be erected.

Considerable inquiry for traveling cranes has been noted of late, and bids have been opened in the last week for a 200-ton crane for Government jetty work at Eureka, Cal., and for a crane for the San Francisquito power plant of the city of Los Angeles. The demand for other hoisting machinery and general equipment for heavy construction work is well maintained. Many contracts are being let for county road and bridge construction, and preparations are under way for numerous sewer and waterworks projects and inquiries for small crushers, rollers and ditching devices are steadily increasing. The demand for small pumping units, one of the principal factors for the last three months, shows no abatement, and may increase somewhat in the next month.

Electrical machinery is in strong demand, and gas engine manufacturers are apparently feeling the effects of the extension of electric power lines through the interior. At some points very low rates prevail for electricity, and many manufacturing plants are experimenting with this motive power. The success of these test installations will involve the discarding of many steam engines. Hydroelectric development is proceeding rapidly, and figures are now being taken on several large units.

The Pacific Gas & Electric Company, in its Bear River development, has installed a 112-hp. electric hoist made by the Vulcan Iron Works, Wilkes-Barre, Pa., and is steadily increasing its rock and concrete handling outfit.

The Columbia Steel Company, Pittsburgh, Cal., has completed the installation of a converter and is about ready to begin operations.

The State prison directors have decided to install an ice manufacturing plant and a woolen mill at the San Quentin penitentiary.

The Builders' Iron Works, Stockton, Cal., has been incorporated with a capital stock of $25,000, by F. W. and Anna Krenz and Henry Ohm.

It is reported that the main shops of the Northern Electric Railway will be moved from Chico to Sacramento, Cal.

Bids will be received this week for boilers, etc., for a power plant at the southern California State Hospital.

Negotiations have been started for the installation of a large pre-cooling and orange shipping plant by the Union Ice Company at Redlands, Cal., the estimated cost being about $250,000.

The Standard Brick & Tile Company has purchased a manufacturing site at Redlands, Cal., and is said to have ordered machinery to the amount of $20,000. C. A. Rolfe, Redlands, is president.

The California Slate Company expects to commence the development of its property near Planada, Cal., shortly.

The town of Newport, Cal., is considering the installation of a gas and electric plant.

The town of Lindsay, Cal., is taking figures on a municipal pumping plant.

The National Gold Mining Company is preparing to install a five-stamp mill at the Red Top mine, near North Bloomfield, Cal.

The Llewellyn Iron Works, Los Angeles, Cal., is to provide new capacity for the manufacture of steam boilers and will erect a new plant for that purpose.

The Speedwell Motor Company, San Francisco, is erecting a commercial garage and machine shop.

Eastern Canada

TORONTO, ONT., July 20, 1912.

Plant enlargements and the launching of new industrial projects are the order of the day. This fact signifies more than could be expressed in volumes of comment intended to show the magnitude of the crop prospects and the business expectancy based thereon. Existing plants are being enlarged and new plants are being brought into existence because the outlook presented by the crops and by the general economic conditions is commercially so inviting. There is no cloud on the horizon. At all events bankers and the most conservative business men have little of the admonitory note in their remarks upon the situation. People of substance continue to emigrate in large numbers from other countries to Canada. Capital is not being so freely offered by British investors for the reason that the London market has a surfeit of issues of all kinds that must await digestion before Canadian promoters can get as good a hearing as they formerly did. A little more discrimination on the part of British financial houses will be salutary for good Canadian enterprise. Competition from other countries is still keen. The Canadian Manufacturers' Association has drawn the attention of the Customs Department to undervaluations for duty in the case of some large classes of imports. Though the practice is said to be general in the trade done on this side of the line by United States exporters it is alleged to be specially vexatious in the automobile and gasoline tractor business. It is found difficult to maintain checks on the valuations of automobiles for duty because genuine prices fluctuate greatly owing to the addition of improvements, the influence of new patents and the cheapening of the cost of manufacture. New bulletins have been issued to customs collectors on the subject of gasoline tractor and automobile prices. It is understood that several United States manufacturers have been called upon to give documentary verification of the prices submitted as market prices for customs entry in Canada, and that those of them who declined were threatened with the anti-dumping duty.

Letters patent have been issued incorporating the Olympic Powder Company, Toronto, with a capital stock of $100,000. The company will manufacture and deal in powder, dynamite and other explosives.

Industrial Commissioner B. J. McCormick, Welland, Ont., has completed negotiations for the Metal Chemicals, Ltd., to locate there an electric smelter, the company having purchased the local electric smelter plant and 10 acres adjoining. The following are the officers of the company: President, J. W. D'Augero; vice-president, M. E. D'Augero; secretary-treasurer, J. H. Charles; directors, George W. Vaness, of New York, and other capitalists from Toronto. The company has been operating a smelter on Dufferin street, Toronto, but its premises were too small, and it will remove to Welland. Spurs will be run into the works and in addition to the old buildings new ones will be erected and 100 men will be employed at the beginning.

The Brown Hoisting Machinery Company, Cleveland, has acquired the control of M. Beatty & Son's plant in Welland, Ont., for manufacturing contracting plants and dredges and will double its capacity.

Charles Cantley, assistant to the general manager of the Nova Scotia Steel & Coal Company, reports that active preparations are afoot for the construction of the plant of the Eastern Car Company, which will go into the manufacture of steel cars. The plans for the building, which will cover about 14 acres of ground, are well in hand. The site selected is at Trenton, a suburb of New Glasgow, N. S.

The large plant of the Sarnia Fence Company, Sarnia, Ont., is receiving a big addition. The new building will be several hundred feet long and sufficient to accommodate a large number of new looms. This company has been very prosperous since its formation and has secured a big trade all over the Dominion.

Two by-laws of an industrial nature were recently carried by the ratepayers of Owen Sound, Ont., by large majorities. The first by-law provided for a loan of $20,000 to J. H. Cote for the establishment of a factory for the manufacture of wire and wire nails. The second by-law was for the purpose of authorizing a loan of $20,000 to the Superior Match Company, which manufacture maches by a new method.

The Northern Aluminum Company, Ltd., Shawinigan Falls, Que., has taken out a permit for a $50,000 one-story shop on Sterling road, near Symington avenue, Montreal. The building will be constructed of brick, steel and galvanized iron.

D. Lorne McGibbon, president of the Canadian Consolidated Rubber Company, Montreal, announces that the company has accepted the $25,000 bonus offered by the Berlin Town Council to erect a $1,000,000 auto tire plant in that place. At one time the company was considering erecting the plant in Hamilton, Ont., and had even gone so far as to get options on property.

The Canadian Locomotive Works, Kingston, Ont., will expend $50,000 in the erection of new pattern and carpenter shops at Kingston, Ont. Reinforced concrete construction will be used throughout.

The construction of the great floating dry dock at the Polson Iron Works plant, Toronto, has been begun. The machinery now arriving from England includes a multiple punch 60 ft. long, weighing 46 tons, and which has a capacity of 480 holes a minute. The shipment also includes a large traveling crane. The punch is operated by electricity and sets itself automatically. It is hoped to have one section of the dry dock completed this fall and the entire dock by next spring. The centrifugal pumps, which will dewater the huge dock in 20 minutes, are being built in Toronto and are now nearing completion.

It is announced that the mill in Hespeler, Ont., formerly belonging to the Canada Woolen Mills Company, but for the last eight years idle and unoccupied, has been acquired by a limited liability company for the purpose of manufacturing stove furniture and fittings. The company is composed of five men whose names have not been divulged at the present stage, who have subscribed $50,000 to the paid-up capital stock of the new concern. It is expected that by April next 500 hands will be employed and this will be later increased by several hundred more.

The Taylor-Forbes Company, Guelph, Ont., is about to enlarge its radiator plant.

The Raymond Mfg. Company, Guelph, Ont., is enlarging its factory.

The White Machine Works, Ltd., has been incorporated with a capital stock of $40,000 to manufacture and sell all kinds of sawmill and planing mill furnishings, sharpeners and machinery in general, with head office at Windsor, Ont.

The Canadian Ingersoll-Rand Company, Sherbrooke, Que., is preparing to add an electric power house to its plant.

A warehouse to cost $100,000 will be erected on Stafford street, Toronto, by the Massey-Harris Company, Ltd. The building will be of reinforced concrete, with a cement foundation, and will be fireproof throughout. The floors and roof will be of reinforced concrete. Metal sash, with wired glass, will be used throughout.

The Diamond Flint Glass Company is putting up a factory in Montreal.

The Ogilvie Milling Company is preparing to erect

a flour mill of 800 bbl. daily capacity at Port Colborne, Ont.

The Baker Motor Vehicle Company, Toronto, is building a factory.

The Hamilton Trolley Wheel Company, Ltd., Hamilton, Ont., has been incorporated with a capital stock of $60,000 to engage in the manufacture of trolley wheels. Harry Brown, Hugh McReynolds and Harold B. Carter are the provisional directors.

Western Canada

WINNIPEG, MAN., July 18, 1912.

The local machinery men have been taking much interest in the annual exhibition. A large number of machinery firms are exhibiting this year, and it is understood that substantial orders have been booked since the fair started. The industrial atmosphere continues clear and local managers report prospects very favorable. Representatives of several Eastern manufacturing concerns have been in Winnipeg and other Western centers with a view to investigating the opportunities for branch factories. In the case of one or two firms important announcements are expected within the next week or two.

The announcement has been made that the Fort William plant of the Canada Iron Corporation is to be enlarged soon at a cost of $200,000, to permit of the manufacture of car wheels to supply the plant of the Canada Car & Foundry Company at that city.

Brown & Rutherford, Winnipeg, have taken out a permit for the building of a large lumber mill and woodworking plant to replace the one which burned in the spring. It will cost about $100,000 and will be equipped with the latest machinery. It will be electric driven and the company will generate its own power.

Swift & Co., Chicago, with several branches in Canada, will establish a cold storage and packing plant at Lethbridge, Alberta.

The Winnipeg Street Railway Company has let the contract to Carter, Halls, Aldinger & Co., Winnipeg, for the construction of a ten-story office building. The permit, which has just been issued, gives the cost at $500,000. The architects are Pratt & Ross, Winnipeg.

The Canadian Northern Railway is erecting a ten-stall roundhouse at Radville, Saskatchewan.

The town of MacLeod, Alberta, is installing a modern filtration plant, to cost $50,000.

The citizens of Fort William have passed several industrial by-laws involving concessions to the plants of the Canada Car & Foundry Company, the Great West Wire Fence Company, the H. D. McKeller Bedding Company and the A. N. Nanton starch works. The establishing there of the different plants will involve an aggregate expenditure of about $2,000,000 by the firms concerned.

C. F. Beakbane, manager of the Avery Scale Company, Milwaukee, Wis., has been in Winnipeg conferring with the manager for western Canada regarding the opening of a branch factory in Winnipeg.

The Fort William Elevator Company, Ltd., Winnipeg, has been incorporated, with a capital stock of $500,000. The provisional directors are David Horne, manager; Herbert E. Swift, G. H. Yule, William E. Davidson and M. M. Perdue, all of Winnipeg.

The Capital City Box Company, Edmonton, Alberta, has been incorporated with a capital stock of $160,000.

The Western Foundry & Machine Company, Edmonton, has been incorporated with a capital stock of $50,000.

The Great West Specialty & Iron Foundry Company, Edmonton, has been incorporated with a capital stock of $100,000.

The City Commissioners of Edmonton, are receiving tenders, until July 31, for the construction of an artificial gas plant. The engineer is J. A. Latournell, Edmonton.

Construction has been started on a cement plant at Saanich Inlet, B. C., which will have a capacity of 2000 barrels daily. It will employ 250 men.

E. J. Clark, managing director of the Hart Accumulator Company, London, England, is one of the large party of British manufacturers en tour in Canada. He says his company will establish branch works to make storage batteries either in Winnipeg or Fort William.

Government Purchases

WASHINGTON, D. C., July 22, 1912.

The Watertown Arsenal, Watertown, Mass., will receive bids until August 12 for the construction and equipment of a power plant.

The Depot Quartermaster, Washington, D. C., will receive bids until July 30 for the installation of a water system at Crow Agency, Mont.

The United States Reclamation Service, Federal Building, Los Angeles, Cal., will open bids August 2, under specification No. 126, for furnishing four direct connected pumping units, four direct pumping units except that motors shall be wound for 2200 volts instead of 440 volts and for four 4-in. low pressure gate valves.

Canal circular 720, of the Isthmian Canal Commission, Washington, calls for a testing machine, locomotive tires and a quantity of miscellaneous small tools. Bids to be opened July 29.

Capt. E. A. Waldron, Corps of Engineers, United States Army, New London, Conn., opened bids June 15 for a central power plant Corregidor Island, P. I., as follows:

Item 1, 375 kva. turbine generators and condensers complete—Bidder 4, Power Equipment Company, Boston, Mass., $11,180; 5, Kerr Turbine Company, New York, $11,105; 6, Allis-Chalmers Company, Milwaukee, Wis., $11,915; 7, Ridgway Dynamo & Engine Company, Ridgway, Pa., $9,645; 8, Westinghouse Electric & Mfg. Company, Boston, Mass., $37,618, total.

Item 1A, three 375 kva. turbine generators without condensers—Bidder 4, Power Equipment Company, Boston, Mass., $8,223; 5, Kerr Turbine Company, New York, $8,121.67; 6, Allis-Chalmers Company, Milwaukee, Wis., $8,932; 7, Ridgway Dynamo & Engine Company, Ridgway, Pa., $6,800; 8, Westinghouse Electric & Mfg. Company, Boston, Mass., $24,148, total; 9, General Electric Company, Schenectady, N. Y., $8,611.

Item 2, one 125 kva. turbine generator complete—Bidder 4, Power Equipment Company, Boston, Mass., $4,355; 5, Kerr Turbine Company, New York, $3,650; 7, Ridgway Dynamo & Engine Company, Ridgway, Pa., $3,800; 8, Westinghouse Electric & Mfg. Company, Boston, Mass., $7,300, total; 9, General Electric Company, Schenectady, N. Y., $3,925.

The Algoma Steel Company's Operations

At the end of this month or at the beginning of August, as may be convenient, says a local newspaper, the Algoma Steel Company, Sault Ste. Marie, Ont., Canada, will close down its entire steel-making plant for about two weeks, to enable it to proceed with the installation of new rolling mills and engines. One mill is a 35-in. blooming mill with a 55 x 60-in. engine. This mill will, it is expected, produce nearly twice as much as the old mill which is being displaced. The engine is already on its foundations, and all preparations are being made to have the new mill assembled ready for erection as soon as the plant closes down. In addition a new 28-in. rail mill will be put in place, the engine being already in position to operate. What the company will lose in output during the period of shutdown will be more than compensated for when the new mills start up, as the capacity for turning out steel rails will be increased 50 per cent. While the company is making all preparations in expectation of sufficient orders for steel rails, it is not altogether pleased with the outlook for the merchant mills, orders for which are not overplentiful.

The William Cramp & Sons Ship & Engine Building Company, Philadelphia, Pa., has in course of erection a new machine shop at Richmond and Dyott streets, adjoining its present machine shops. The building will be 141 x 480 ft., with three bays, of the 80 per cent. window type. There will also be provided a storage yard which will be served by a 20-ton crane. The equipment will be of the latest electrically-driven machinery consisting of boring mills, lathes and other large machines and seven cranes consisting of one 5-ton, one 10-ton, three 30-ton, one 50-ton and one 75-ton. The buildings will be equipped with an electric lighting system as well as suitable sanitary arrangements for this class of shop, electric elevators, fire-escapes etc. The output of the new plant will be approximately 500 cars of machinery a year.

The Taylor Iron & Steel Company, High Bridge, N. J., has recently opened an office at Pittsburgh, Pa. This new office will be located at Room 301, Oliver Building, and will be in charge of James S. Morrison. This action has been taken as the result of an increasing demand in this vicinity for Tisco manganese steel, the sales of chain having been exceptionally heavy.